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UNIVERSITY OF ALBERTA

LINKING ENVIRONMENTAL ATTITUDES AND BEHAVIOUR:
THE SOCIAL CONTEXT OF RECYCLING IN ALBERTA

BY

LINDA A. DERKSEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF SOCIOLOGY

EDMONTON, ALBERTA

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Linda Derksen
#7-10745-85 Ave.
Edmonton, Alberta
T6E 2K9

Date: October 12, 1990

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SUBMITTED BY Linda Derksen

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

J. Gartrell
Dr. J. Gartrell

Dr. G. Fearn

Dr. J. Butler

Date: September 24, 1990

ABSTRACT

This paper links the micro level of individual behaviour with the macro level of social structure by comparing recycling in the province of Alberta, Canada, in three different social contexts: rural and small town Alberta; a major urban center (Calgary); and a major urban center with an organized curbside recycling program (Edmonton). Survey data from 1,245 respondents show that while most people are extremely concerned with environmental issues, this concern affects behaviour only in Edmonton where an organized recycling program exists (the "Blue Box" program). Environmental concern has no direct effect on recycling, but does interact with the recycling program in Edmonton. Whether people are concerned about the environment or not makes no difference in the amount they recycle except in Edmonton, where the Blue Box program is in place. However, even the unconcerned people in Edmonton recycle, showing that the organized program, or mechanism, is a more important influence on behaviour than individual attitude. The only variables with a direct effect on recycling were age and education, which both displayed weak, positive effects on recycling.

In a separate examination of the causes of environmental concern, multiple regression analysis shows that less than one percent of the variance in environmental concern can be explained using age, education, income, job prestige, sex, and rural/urban residence as predictors. An exploration of data from thirteen European countries, the United States and Canada indicates that environmental concern has become a cultural constant. Generally, between 75 and 95 percent of any given sample reports high levels of concern with a wide range of environmental issues. Evidence suggests that these highly skewed distributions are typical for environmental concern, and this lack of variation may explain environmental sociology's lack of success in identifying the causes of environmental concern. It is suggested that a more appropriate research topic is to explore the conditions under which environmental concern can be translated into pro-environmental behaviour, such as recycling.

KEYWORDS: environment; environmental concern; environment - attitudes; environmental sociology; environmental problems; micro-macro link; recycling

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I. INTRODUCTION

Environmental problems have generally been classified as technical, scientific problems, and hence the major emphasis in scientific work has been on the technical causes and solutions to environmental problems. Early works such as Rachel Carson's *Silent Spring*, Barry Commoner's *The Closing Circle* (Commoner, 1971) and the Club of Rome's *Limits to Growth* (Meadows et *al*, 1972) focused on the ecological effects of technological growth and development. If social causes or effects of environmental problems were mentioned, they were generally not identified as a problem worthy of scientific investigation. More recent efforts, such as the United Nations' World Commission on Environment and Development (Brundtland, 1987) clearly state that management of environmental problems requires massive social change. However, the research emphasis is still on the technical aspects of environmental problems. In short, the natural science literature focuses on technical aspects of environmental problems, and pays lip service to the idea that solutions require social change. In turn, the social science literature takes one of two approaches. The first, and most prevalent, is a very micro focus which examines individual environmental attitudes and behaviour and in the process ignores broader social processes altogether. The second is a very macro, theoretical perspective which tend to locate the causes of environmental problems solidly within western capitalist society, science and technology, and completely overlooking the role of human agency.

Although environmental impacts are intrinsic to all forms of social organization (Schnaiberg 1980), environmental problems are inevitable in a culture in which endless economic growth is a primary goal (Devall, 1980). The economic growth idealized by western cultures requires the development of science and technology, which are based on the domination and control of nature. Industrial society, based on the expansion of production, requires a technological rationality which leads people to see satisfaction of needs as identical with (or obtained through) consumption of commodities (Leiss, 1976; Jones, 1987a). If consumers' needs and wants are largely created by producers anxious to sell their products (Leiss, 1976), then ameliorative programs such as recycling will ultimately have little environmental effect.

The current focus of environmental action in North America is on the individual, who is told not to consume less, but to dispose carefully, and consume and purchase "green" products where possible. The trend in North America (which is mirrored in the sociology literature) is to emphasize the role that individual behaviour plays in both causing and solving environmental problems. This emphasis is potentially dangerous in that it masks the equally social role that governments, institutions and corporations play in large scale environmental degradation. The larger issues of over-consumption and over-production are not addressed, perhaps because a powerful movement focusing on the reduction of consumption and redefinition of needs and satisfaction would undercut the industrial system which gives us life as we know it. For the expansion of production and industrial society to survive (ignoring ecological limits for the moment), ecological problems must be viewed as problems of individual behaviour and attitude, the focus must be individual behaviour change (in everything but consumption), and needs and values must not shift from a commodity satisfaction basis.

It is recognized that recycling programs, such as the one examined in this paper, which are aimed at changing individual action are ultimately ameliorative, not transformative. Their success comes in part because they fit with the dominant liberal ideology and its concurrent focus on individualism; programs of this type allow individuals to feel that they are making pro-environmental changes in their lives without really changing anything but the colour of the garbage can. Indeed, the current global trend is towards increased consumption, but with a new focus on consuming "green" products, or purchasing from companies with good environmental track records.

Perusal of the major sociological journals shows that despite the increasing media, state and corporate attention given to environmental problems, in recent years sociology has paid little attention to environmental problems. Investigation into environmental problems has been marginalized within sociology. Most existing research was undertaken in the 1970s, and reflects a strong ideological and methodological emphasis on the individual. As suggested by Catton and Dunlap (1978), the ideological biases of western society have prevented the empirical environmental sociology literature from focusing on the big, important questions of the relationship between human beings and their environment. However, the more critical, theoretical literature in environmental sociology swung too far to the other extreme, forgetting that individual behaviour is affected by social structure and context, and that both levels of analysis provide needed insights.

A. Purpose of the study

This paper examines recycling in Alberta, comparing the items that people in Edmonton, Calgary and the rest of Alberta (mostly rural and small town areas) recycle. The purpose of the paper is to show the link between individual agency and social structure in the area of environmental concern and recycling. Specifically, it shows that while most people are concerned about the environment, only those people who are in an area with an organized recycling program can act on that concern. The relative importance of individual attributes such as age and education, as well as the constraints and opportunities elements placed on individual behaviour by the larger social structure or context (e.g. Edmonton's Blue Box recycling program) are examined. It is shown that social structure plays a larger part in determining how much people recycle than do individual attributes.

The paper will attempts to forge a link between the micro individual level of analysis and the macro social, or community level by examining what types of items are recycled by individuals in three different social contexts: 1) rural/small town; 2) urban; and 3) urban with an ongoing curbside recycling program. We will show that while most individuals are very concerned with the state of the environment, they are unable to act on this concern in most social contexts. We will demonstrate that an individual's level of environmental concern affects their behaviour only in the urban area with a curbside recycling program, in other words, in the social environment which promotes and facilitates that pro-environmental behaviour.

B. Contributions of the study

The contributions of the study are threefold. First, to date there are no studies of this type in the environmental sociology literature which compare recycling between communities where there is a difference in individual opportunities for recycling (as provided by Edmonton's Blue Box program). This type of research is needed to evaluate the effects of social context on behaviour, and to evaluate to what extent social structure and individual attitudes and attributes affect pro-environmental behaviour.

Second, the environmental sociology literature is desperately in need of research which links the micro and macro levels of analysis (Buttel, 1987), as previous studies either focus exclusively on the individual level or the macro level. This paper attempts to do so by showing that while most individuals are concerned about the environment, environmental concern affects individual behaviour only in communities which have an institutionalized recycling program in place. In other words, there is an interaction between individual levels of concern and social context in producing behaviour (in the form of recycling).

Third, as illustrated in Appendix A, environmental concern has become a "cultural constant" in western societies, to the extent that between 75 and 90 percent of any sample will express "concern" with environmental issues. This holds across many substantive issues (e.g., air pollution, deforestation, toxic waste, general environmental concern), and across country (13 European countries, Canada and the U.S.). This is important for at least two reasons. First, these highly skewed distributions with their concurrent lack of variance are alone enough to explain why the environmental sociology literature has had so little success in explaining the "causes" of environmental concern. Second, although individuals in western society share a high, extreme level of concern with the environment, individual behaviour towards the environment differs widely. This suggests that either individual concern does not affect behaviour, or as developed in this paper, individuals can only act on their concern under some social circumstances.

II. BACKGROUND

A. Sociological approaches to the environment

Sociology has studied the environment from two main perspectives. The first is characterized by empirical research on individual attitudes and behaviour. This literature has unsuccessfully attempted to locate the causes of environmental concern or pro-environmental behaviour in socio-demographic variables such as age, sex, income, job prestige and rural/urban residence. Some experimental research has been undertaken with behaviour, but experimental designs have utilized trite manipulations and hence failed to produce the desired effects on individual behaviour. The empirical attitude and behaviour literature has paid almost no attention to the effects of larger social processes or contexts on either attitudes or behaviour.

The other dominant sociological approach to the environment is a very macro, theoretical body of literature which tends to locate the causes environmental problems solely in western capitalist society and science, rather than in the process of production itself. While this literature examines large social processes, it makes no attempt to link these processes to individual attitudes or behaviour. As well, these theoretical perspectives are not formulated systematically in a form which is amenable to empirical testing.

B. Variation in environmental concern

Mounting evidence shows that concern with "the environment" and environmental problems has become a cultural constant in western industrialized nations. Appendix A presents recent survey data which shows that distributions of environmental concern tend to be highly negatively skewed, with frequently more than 90 percent of a given sample in the highest "concern" category (Derksen, 1990). The similar pattern observed in many different data sets may indicate that extreme environmental concern has become such a widespread phenomenon that it is now virtually invariant in most western societies. The most meaningful distinction may be a dichotomous one, between those who report concern with the environment, and those who report no, or low levels of concern. As well, these very skewed distributions may be the cause of low correlations and insignificant regression slopes found in many multivariate analyses of environmental concern. This simple observation may account, in part, for the failure of empirical investigations to identify the causes of environmental concern at the individual level. This constancy of concern suggests that explanations for variation in pro-environmental behaviour must be sought at the macro, or community level, rather than in differences in individual attitudes.

C. Explanations for variation in environmental concern

Micro-oriented explanations for the social bases of environmental concern have focused on relationships between indicators of concern and age, sex, education, income, job prestige, rural/urban residence and political ideology. Consensus is that relationships are at best weak, at worst non-existent (Samdahl and Robertson, 1989; Buttel, 1987; Van Liere and Dunlap, 1980).

In an analysis of 21 empirical studies of environmental concern, Van Liere and Dunlap (1980) found support for a moderate negative relationship between age and concern, and some support for a positive relationship between education and concern. They advise caution, however, in asserting either direction or strength of relationship, since many studies report negligible relationships. For income, they find the relationship is "quite ambiguous and fails to support the hypothesized positive association" (1980:190). While they concluded that social class is positively related to environmental concern, several studies contradict this, saying all the variation explained by social class is explained by education alone (see Buttel and Flinn, 1978; 1974).

Sex was not related to environmental concern, although urban residents, as well as democrats and liberals, are slightly more concerned than rural residents or republicans and conservatives.

Where correlations were found at all, they were very small. The largest were for age, where the correlations varied between -.2 and -.4 (Van Liere and Dunlap, 1980:189). Samdahl and Robertson (1989) found only small correlations between age and three environmental concern scales: r = -.032, .006, .261; with education, r = .207, .326, -.009; and with income, r = -.100, -.153, -.118.

Buttel and Flinn (1978) found environmental concern correlated with education, r = .231, and with age, r = -.295; but Buttel and Johnson (1977) found a correlation with education of only r = .076. Dunlap and Van Liere (1978) found their own New Environmental Paradigm displayed very small correlations with age, r = .09, and education, r = .11. For occupational prestige: "while a majority [of the correlations] are positive, most are so slight that it is difficult to conclude that the hypothesized relationships are supported" (Van Liere and Dunlap, 1980:190).

The general explanatory power of demographic variables in multiple regression is also low. In examining several environmental concern scales, Dunlap and Van Liere (1984) found that age, education, income, residence and sex together accounted for only 4 percent of the variance in their New Environmental Paradigm scale; 2 percent in the population control scale; 11 percent in pollution control; 5 percent in resource conservation; 6 percent in environmental funding; and 7 percent in environmental regulations. Utilizing the same data as Dunlap and Van Liere (1978 and 1984), Hand and Van Liere (1984) found that they could explain only 10 percent of the variance in a pollution control scale, 7 percent in their mastery-over-nature scale, 1 percent in population control, 3 percent in resource conservation, 6 percent in environmental spending and 5 percent in environmental regulations scale.

In summary, there is some support for a weak negative relationship between age and concern, and weak positive relationships with education, urban residence and liberalism (Buttel, 1987:473; Van Liere and Dunlap, 1980). Most studies find little or no relationship between environmental concern and income or occupational prestige (Van Liere and Dunlap, 1980). As well, all these variables rarely account for more than 10 percent of the variance in indicators of environmental concern (Buttel, 1987). Samdahl and Robertson

(1989) suggest that given the failure of these traditional micro-explanations for variation in environmental concern, future research should focus on "broader belief systems (such as liberal ideology)" (1989:79).

However, research aimed in this direction, such as Catton and Dunlap's New Environmental Paradigm (Catton and Dunlap, 1978, 1980; Dunlap and Van Liere, 1984), demonstrated several things. First, the New Environmental Paradigm was advanced as a meta-theoreotical perspective which would revolutionize the practice of all sociology. Given this mandate, survey research was an inappropriate method for the testing and validation of its propositions. Second, even the results of the survey research show that traditional micro explanations do not explain the variance in "broad belief systems" as measured by the New Environmental Paradigm (Dunlap and Van Liere, 1984). Third, the twelve different environmental questions in the New Environmental Paradigm showed again that when people are asked any question about the environment, they tend to respond in a pro-environmental fashion (Derksen, 1990; also see Appendix A). This leads to an attenuation of variance, and makes traditional correlational and regression techniques difficult to use.

Rather than investigating "broader belief systems" (Samdahl and Robertson, 1989), the most appropriate question is to focus on the conditions under which concern with environmental issues is translated into pro-environmental behaviour. This changes the research question from one which explores variation in environmental concern at the micro, individual level, to one which looks at the social contexts which promote pro-environmental behaviour, and examines under what social conditions environmental attitudes can translate into behaviour.

D. Explanations for recycling behaviour

Although most of the environmental sociology research has focused on environmental attitudes, there is also a body of literature examining pro-environmental behaviours such as recycling. As with the attitude literature, the search for determinants of recycling behaviour has focused almost exclusively on the individual, largely ignoring the possible effects of social and cultural context on behaviour.

Adoption rates for the sorting and separation of household waste for recycling have been disappointing (De Young, 1986a:436). The massive amounts of waste generated in contemporary North American society are regarded as a "behavioral problem of massive proportion" (Jacobs and Bailey, 1982:141). As in environmental concern, socio-demographic variables have little influence on behaviour (Vining and Ebreo, 1990; De Young and Kaplan, 1986), although there is evidence for a weak positive relationship between recycling and age (Vining and Ebreo, 1990). In an experimental study of the effects of extrinsic incentives (such a payment for recyclable goods) on recycling behaviour, Jacobs and Bailey (1982) found that any type of intervention increased recycling behaviour over baseline levels, but concluded that bi-weekly informational "prompts" to recycle were the most effective in increasing behaviour. However, while extrinsic incentives generally increase the desired behaviour, they were not effective at maintaining or creating "long-term, enduring changes in behaviour" (De Young, 1986a:438). Intrinsic motives such as satisfaction with the "frugality" of recycling may be important determinants of recycling behaviour (De Young, 1986a, 1986b; De Young and Kaplan, 1986). Vining and Ebreo (1990) suggested that knowledge and motivational factors were important determinants of behaviour, but found that while recyclers had more information about recycling than nonrecyclers, "nonrecyclers were no different in the strength of their belief that protecting the environment was an important reason to recycle" (1990:68).[2]

The literature on recycling behaviour suffers from the same "subjectivist and microsociological" focus that plagues the environmental concern literature. Because the theoretical definition of the problem is one of individual behaviour, research designs do not incorporate the macro-structural level, thus restricting "causes" of behaviour to the socio-demographic and attitudinal variables. This theoretical framework ignores the social and cultural context which rewards increasing consumption in a society which bases success on ever-increasing economic growth. Defining the problem as an individual behavioural problem has resulted in study of the symptom, rather than the disease, and fits neatly with the American ideology of individualism: environmental problems are reduced to those of individual behaviour, not social structure or organization. This has lead to the futile pursuit of increasingly refined concepts of environmental attitude and behaviours in the belief that more specific measurement will finally demonstrate causal links (Weigel, 1985). The result is a dangerous "restriction of range" problem at both the theoretical and methodological levels in terms of the possible effects of macro structure on environmental behaviour. Given the inability of socio-demographic variables and individual attitudinal and motivational variables to explain recycling behaviour, the problem is to identify a link between macro social structure or context, and individual behaviour.

III. THEORETICAL FRAMEWORK

A. The micro-macro problem in environmental sociology

The study of environmental concern and behaviour has been conducted almost exclusively at the "micro" or "empirical" level, and has received "theoretical guidance that is exclusively subjectivist and microsociological and that could benefit from a more macrostructural orientation" (Buttel, 1987:484). In contrast, the theoretical literature "is largely structural in nature and stands in need of modification in order to incorporate subjectivity and agency" (Buttel, 1987:484). Theoretical works in environmental sociology have not focused on the issues that empirical researchers have studied, which has resulted in disparate bodies of work with micro empirical research uninformed by theoretical dialogue. Theoretical discourse has not been written systematically and does not attempt to develop testable theories which could inform an empirical research program. The result is that empirical research has wallowed, pursuing a single-minded, micro-oriented, common-sense, almost atheoretical search for the causes of environmental concern and behaviour. At the same time, the theoretical literature has drifted to new heights of macro-abstraction.

The mistake made by the empirical, or micro environmental sociology literature, is the implicit assumption that the macro level is simply the aggregate of the micro, or individual level. "[This] presumption ... shifts the burden of empirical discussion toward contingency and interaction and away from social structure" (Alexander, 1987:295). Because the macro is viewed as a simple aggregation of individual attitudes and values, even the richest, most complex theoretical frameworks produced by this literature cannot include a social structural level of analysis which transcends the individual, and thus are blind to the effects of social structure on individual behaviour. For example, the influential New Environmental Paradigm developed by Catton and Dunlap (Catton and Dunlap, 1978, 1980; Dunlap and Catton, 1978, 1979a; Dunlap and Van Liere, 1978) assumed that the existence of a societal level environmental "paradigm" could be determined by the measurement of individual attitudes and beliefs. The assumption was that the societal or macro level was simply the aggregation of individual attitudes, and thus that individual actions and attitudes determine structure. Further, the aggregate level was erroneously assumed to be important only when investigating "the antecedents and consequences of social organization ...[b]ut [the aggregate level] becomes too restrictive when we seek to examine the entire range of human interaction with the physical environment" (Dunlap and Catton, 1979:67).[3]

B. Towards a micro-macro link

How do different macro structural conditions or circumstances act to condition individual behaviour? A crucial component of action is individual effort (Alexander, 1987), and individuals are free to exert effort in order to act or change a situation. However, many situations are such that the effort required to change the situation is monumental, thus making the probability of the action occurring very low. For instance,

> "[i]t is not that a worker cannot change his or her class position; the contingent nature of action means that he or she certainly has the freedom to do so. The problem is that the time and energy required to alter the work environment are so demanding that the probabilities of the worker changing it are very small. In this way the worker's economic environment becomes an "objective" condition" (Alexander, 1987:298).

Other social circumstances (differences in macro structure or context), increase the probability that individual effort can result in the desired action.

For our purposes, the link between micro and macro can be as simple as saying that certain macro structural conditions (e.g., presence or absence of a curbside recycling program) increase the probability that the desired pro-environmental behaviour (recycling) will occur. Some social contexts make it difficult for individuals to perform the behaviour (action) of recycling, because its performance requires so much time and energy. To recycle food cans, for example, requires that they be rinsed out and stockpiled until a sizeable quantity is obtained. Then they must be picked up or taken to some place willing to pay or take them for recycling. Individuals do not normally have access to a recycling market or consumer for other objects such as milk cartons and glass jars. Contemporary western society promotes consumption and disposal rather than recycling and conservation. A behaviour such as recycling is unlikely to occur with high frequency unless the social context supports and encourages the behaviour. Curbside recycling programs, are one way to change the social context to one which increases the probability of the desired behaviour, in this case, recycling. In the absence of institutionalized recycling programs, individuals stockpiling items (normally considered "garbage") for recycling may easily be in violation of some municipal health bylaws. The widespread performance of other pro-environmental behaviours, e.g., regularly using bicycles for transportation to work, would result in chaos in cities which are designed primarily to accommodate cars and trucks on roads and in parking lots.

This is not to suggest that individuals cannot engage in the behaviour of recycling, but instead to suggest that the time and energy required to do so are so high that the probabilities of the individual actually doing so are very small. Individual resources such as environmental concern and education cannot overcome the structural barriers acting to decrease the probability of the behaviour. Hence, other than returning beverage containers for refund, and sometimes dropping newspapers off in recycling bins (mechanisms with fairly widespread availability in most urban contexts), most people will not recycle to any great degree -- in other words, the "norm" in most social contexts is one of non-recycling.

If the macro-structural context is changed (i.e., one in which a mechanism for recycling is institutionalized) the probability of the behaviour will increase because the effort required on the part of any single individual decreases. Further, the institutionalized program creates a new norm within that social context, one of recycling. Only in this context will individual resources such as environmental concern and education be able to act by enhancing the effect of the social context on behaviour.

"Norms and conditions are macrosociological elements" (Alexander, 1987:296), and a program which institutionalizes recycling at the level of social structure changes both the norms and conditions in that area. Having a program in place with the "end" or goal of recycling changes the "objective possibilities" of individual action and provides a new "normative standard" of evaluation, which will act together (at the macro level) to increase the probability of individual behaviour (the micro level). An empirical test requires variation in the macro-structural properties thought to condition the behaviour.

Given this framework, some empirical relationships can be predicted. First, environmental concern generally displays very little variance, with typically 90 percent of any given sample indicating that they are "concerned" about the environment (Appendix A). Therefore we predict that environmental concern will display low correlations with both socio-demographic and behavioural indicators (Hypothesis 1), and that socio-demographic characteristics will explain very little variance in environmental concern (Hypothesis 2).

Second, we would expect that, on average, the behaviour of recycling is the lowest in rural areas, higher in urban areas, and the highest in urban areas with institutionalized recycling programs (Hypothesis 3).

Third, if the socio-demographic characteristics of age, education, income and job prestige have any effect on recycling behaviour, the effects will be the strongest in the urban area with a recycling program. In other words, Hypothesis 4 predicts an interaction effect between socio-demographic indicators and macro-structural conditions, rather than a main effect.

Last, it is expected that individuals with high environmental concern will display the same level of recycling behaviour as individuals with low concern, except in the area with a recycling program (Hypothesis 5).

IV. DATA ANALYSIS

A. Measurement of concepts

In operationalizing "macro social structure", the province of Alberta was divided into three areas (Table 1). The first was rural and small town areas, considered as one area. The second was a major urban centre with no recycling program, and the third was a major urban centre with an ongoing curbside recycling program. Within this centre, only single family dwellings had access to the curbside recycling or "Blue Box" program.

Environmental concern was operationalized as the response to the question "How concerned are you about the state of the earth's environment?" There was little benefit to using a multiple item index for environmental concern, since environmental concern functions more like a constant than a variable (see Appendix A). When environmental concern (CONCERN) was treated as the dependent variable (Hypothesis 1), it was left in its original 7 point scale form. For the purposes of the regression analysis of recycling behaviour, when CONCERN was an independent variable it was recoded into two groups: low concern and high concern in order to more easily handle interactions.

Recycling behaviour was the sum of the number of different types of items which were recycled in respondents' households at the time of the survey. This included beverage cans and bottles, newspapers, household plastics, milk cartons, food cans, other paper products, compost material, motor oil, glass jars and glass.

Age was the actual number of years, derived from respondents' responses to what year they were born in, and education was the actual number of years of education the respondent had completed. Income was the respondent's individual income to the nearest income category, and job prestige was operationalized using the 1981 Socioeconomic Index for Occupations in Canada (Blishen, Carroll and Moore, 1987). Table 1 gives the range and coding of each of the variables and interaction terms.

Within the city of Edmonton, only single family dwellings had access to the Blue Box recycling program, therefore a two-way interaction term (HOUSEEDM) was created. This dummy variable equalled one for Edmonton residents in single family dwellings.

To test hypothesis 5 a three-way interaction term was created between environmental concern, Edmonton residence and dwelling type. High concern was coded as zero, making this larger group the reference group. The three way interaction term (CONHEDM) took on the value of one for *low* concern residents in Edmonton in single family homes.

Table 1
Concepts, indicators and range of variables

CONCEPT	**INDICATORS**	**RANGE**
Variation in social context (i.e., presence or absence of recycling program)	1. **EDMONTON + HOUSE**: access to regular, ongoing recycling program (**HOUSEEDM**)	1 = single family dwellings in Edmonton 0 = multi family dwellings in Edmonton
	2. **CALGARY**: urban centre	1 = Calgary resident
	3. **ALBERTA**: rural and small town areas	1 = rural or small town Alberta resident
Environmental concern	**CONCERN**: "How concerned are you about the state of the earth's environment?"	1 = Not at all concerned 7 = Very concerned
	In the reduced form equation, **CONCERN** is a dummy variable, taking on the value of 1 for low concern respondents.	1 = Low concern 0 = High concern
Recycling behaviour	**RECYCLE**: Responses to open ended question "What items are currently recycled in this household?" See Appendix C, for response categories	0 = no items 9 = 9 types of items
Interaction between environmental concern and access to recycling program (effect of environmental concern in this social context)	**CONHEDM**: (concern + house + Edmonton)	1 = **LOW** concern single family Edmonton

Table 1 continued

CONCEPT	**INDICATORS**	**RANGE**
Respondent's education	**EDUC**: number of years of schooling completed	actual number of years coded
Respondent's income	**INCOME**: respondent asked to identify category closest to their total income for the year	01 = under $6,000 TO 27 = over $80,000
Respondent's age	**AGE**	coded in actual years
ADDITIONAL ENVIRONMENTAL INDICATORS FROM THE 1990 ALL-ALBERTA STUDY		
Optimism regarding environmental future	**OPTIMISM**: "In your opinion, what is the likelihood of the world's major environmental problems being successfully dealt with in the next ten years?"	1 = Not at all likely 7 = Very likely
Trust in government to solve environmental problems	**TRUST**: "I trust the Alberta Government to manage environment problems adequately"	1 = Strongly disagree 7 = Strongly agree
Choice between pulp mill development and environmental protection	**PULP**: "The benefits from new pulp mills (royalties, taxes, jobs) are worth the damage they may cause to the environment"	1 = Strongly disagree 7 = Strongly agree
Choice between environmental protection and job creation	**JOBS**: "Protecting the environment is more important than creating new jobs in Alberta"	1 = Strongly disagree 7 = Strongly agree

5

Table 1 continued

CONCEPT	INDICATORS	RANGE
Willingness to pay in dollars for environmental protection	**PAY**: "If an environmentally safe alternative to a normally purchased $10 product was available, how much extra money would you pay for it?"	01 = $0 extra 02 = 50 cents 03 = $1 extra 04 = $1.50 05 = $2 06 = $3 07 = $4 08 = $5 09 = more than $5 extra
PERSONAL PROTECTIVE BEHAVIOUR		
	"Please tell me how often you do the following:	1 = Never 7 = Always
Personal protection from sun exposure	**SUN**: "Take steps to be careful about protecting yourself from the sun"	
Purchase of organic foods	**ORGANIC**: "Try to purchase organically grown foods"	
Energy conservation	**HEAT**: "Conserve energy by turning down the thermostat at night"	

B. Data and sampling

The survey data were collected by the Population Research Laboratory at the University of Alberta as part of the 1990 All Alberta Study (Kinzel and Odynak, 1990). For sampling purposes, the province of Alberta was initially divided into three areas: 1) the city of Edmonton, in which face-to-face interviews were completed with 448 respondents; 2) the city of Calgary, from which 401 telephone surveys were obtained; and 3) the remainder of the province, from which a further 396 telephone interviews were completed. Respondent selection was through a two-stage process in which the first stage was selection of households and the second stage was the selection of respondents within the household. The sampling frame in Edmonton consisted of a computerized list of addresses collected by the city during the latest enumeration (1989). Telephone numbers for Calgary and the remainder of the province were selected on a random basis, using the Population Research Laboratory's bank of random telephone numbers.

To ensure an equal distribution of men and women, interviewers were instructed to interview an adult male if they answered the door or the telephone, or to request an interview with an adult male if a female was the first contact. If no adult male was available, interviewers were instructed to interview the female as the respondent. The final data were weighted to reflect the actual population distribution in the province of Alberta, giving weighted Ns of 349 for Calgary, 579 for the rest of Alberta, and 317 for Edmonton providing an overall sample size of 1,245 (Kinzel and Odynak, 1990). Indexes of dissimilarity, computed by comparing sample data to Statistics Canada data for Alberta show that the sample adequately reflects the characteristics of its population (Kinzel and Odynak, 1990:9).

C. Indicators of environmental concepts

A total of twelve questions pertaining directly to the environment were asked of Edmonton respondents, with a subset of four of the most important questions asked of the entire sample. In addition, the first question on the survey asked all respondents to name what they considered to be the two most important problems facing Albertans today. "Environmental problems" were coded separately. For the entire sample, the specific environment questions included a general environmental concern question, and one asking about how optimistic respondents were that the world's environmental problems could be solved in the next ten years. As well, all respondents were asked to list the items that they currently recycled, and were also asked to rate the degree to which they trust the Alberta government to deal with environmental problems.

The additional questions asked of Edmonton residents covered methods of disposal of toxic cleaning solvents, food safety due to additives, pulp mill development, and a question asking whether protecting the environment was more important than creating new jobs. As well, respondents were asked to indicate how much more money they would pay for an environmentally "safe" version of a regularly used product. Individuals were also asked to indicate frequency of personal behaviour in the areas of sun protection, purchase of organic foods, and energy conservation by reduction of thermostat settings at night. All attitude items were scored on a seven-point Likert scale, and recycling items simply recorded the types of items recycled in each household.[4]

D. Descriptive Statistics

In the sample of 1,245 adult respondents 50.5 percent were male and 49.5 percent were female. The average age was 41.13 years, and sixty-one percent of the total sample were married, 18 percent single (never married), 6 percent common-law or living together, 7 percent divorced, 3 percent separated, and 5 percent widowed. Fifty-six percent were employed full-time, while approximately 11 percent were employed part-time. About 12 percent of the sample listed "keeping house" as their primary employment status. About 23 percent of the sample had completed high school, while a further 21 percent had completed further non-university training and slightly over 12 percent had obtained a bachelor's degree (Table 2). The average number of years of schooling for the entire sample was 13.31 years. Average individual income was between $36,000 and $38,000. Regionally, there were differences in average household income with Calgary the highest at $49,667, Other Alberta $45,000, and Edmonton the lowest at $35,692 (Kinzel and Odynak, 1990:9).

Table 2
Demographic Profile of the 1990 Respondents

CHARACTERISTICS	OTHER ALBERTA	CALGARY	EDMONTON
	%	%	%
RELIGION			
Protestant...........	64	55	51
Roman Catholic & Other Catholic.............	25	22	28
Other................	1	5	4
No religion..........	11	19	17
EDUCATION (yrs of schooling)			
less than 12 years	29	15	22
12 - 15 years.......	3	56	51
16+ years	18	30	27
DWELLING UNIT			
single-detached.....	76	62	57
multiple family apartments	9	21	26
row/townhouse.......	2	8	14
semi-detached/duplex	5	8	3
other types	8	1	0
EMPLOYMENT STATUS			
full-time...........	54	57	57
part-time............	11	11	11
other (e.g. keeping house etc.)	35	32	33
HOME OWNERSHIP			
own.................	75	64	53
rent................	25	36	47
MEDIAN AGE IN YEARS	41	35	35

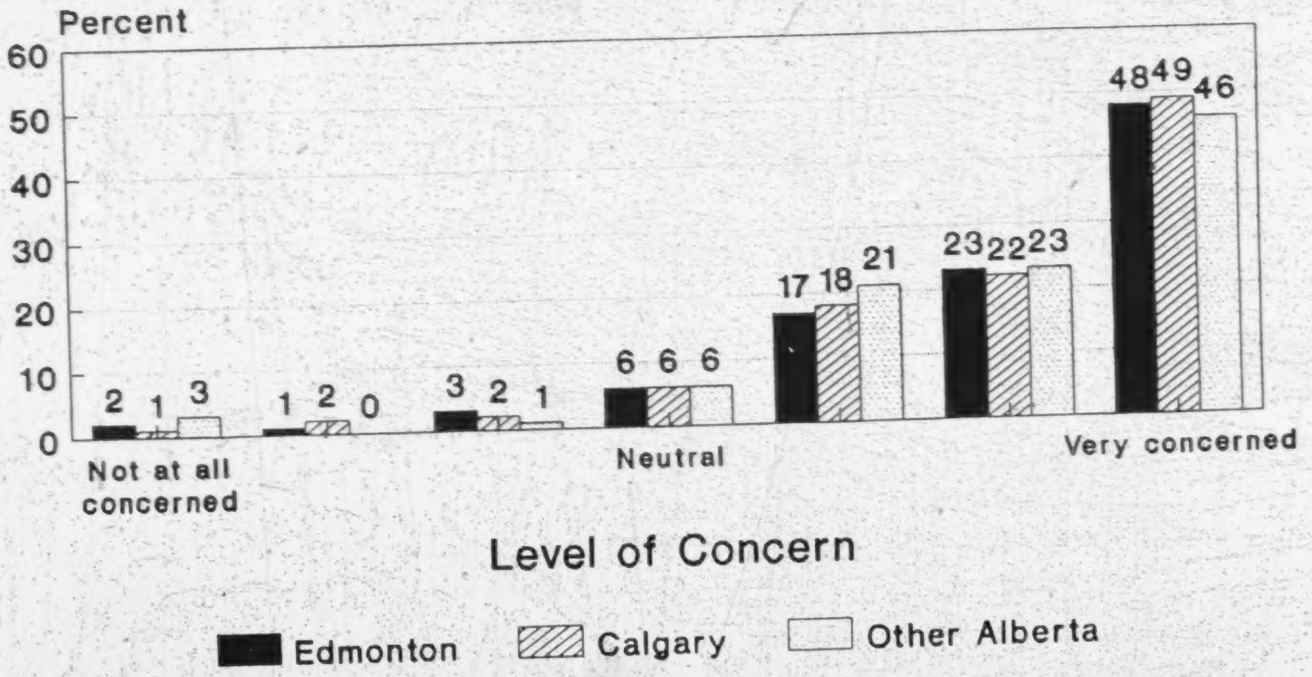
Source: Kinzel and Odynak (1990:8).
(No copywright involved)

1. Environmental concern

On average, Alberta residents share the same high levels of environmental concern expressed by other populations (Appendix A). The mean level of concern is very high at 5.94 (on a 1-7 point scale), with a standard deviation of 1.35. As shown in Figure 1, the vast majority of respondents (89 percent) show some degree of concern about the environment, with almost half (46.9 percent) being "very concerned". The variation is mainly between the "concerned" scores of "5", "6" and "7" on the 7 point scale. The sample size of 1,245 is large enough to provide some variation in the lower end of the scale, but still only 141 people (11 percent) report neutral or low levels of concern. With 89 percent of the sample in the positive end of the scale, it is expected that Hypothesis 1 predicting low correlations between CONCERN and socio-demographic and environmental variables will be supported.

As predicted, CONCERN does not correlate at all strongly with the traditional predictors of age, sex, education, income, job prestige, political affiliation or rural/urban residence (Appendix D). Further, CONCERN does not correlate even moderately with other environmental indicators such as recycling behaviour, optimism over solving environmental problems, personal protective or conservation behaviours. It shows no relationship with trust in government, nor with the

Figure 1
Overall Concern with Earth's Environment
Edmonton, Calgary and Other Alberta



ANOVA shows no significant differences between groups. Mean level of concern is 5.9 on 7 point scale. N = 1,245.

two choice items (pulp mill development versus environmental protection, and job creation versus environmental protection). An analysis of variance shows no significant differences in mean levels of CONCERN between the three regions (Edmonton, Calgary and rest of Province) ($F_{2,1236}$ = .088, $p < .915$). On average, all respondents are "quite concerned" (mean = 5.9 on the 7 point scale).

Within the face-to-face Edmonton sample (N=448), CONCERN's *largest* correlations are $r = .21^5$ with concern over food additives, and $r = -.28$ with pulp mill development, showing a negative relationship between high concern and feeling pulp mill development is worth the environmental risks (see Appendix D for a full correlation matrix). Behaviourally, CONCERN also shows a small correlation (r=.24) with the purchase of organic foods. These small correlations are the largest in the matrix.

2. Recycling behaviour

All respondents were asked to list the items their household currently recycled, with multiple responses allowed. Items were summed and recoded in the variable RECYCLE, providing a ratio level measure of the number of types of items recycled. Prior to creating the index, some interesting regional differences were apparent in the types of individual items recycled (Table 3).

The city of Edmonton has a "Blue Box" recycling program, which collects items for recycling from all single family households within the city limits, while the city of Calgary and the rest of the province do not have such programs. It was expected that Edmonton residents would show a much higher level of recycling than the other two areas, particularly in items such as food cans and other household waste which cannot be returned to depots or placed in bins for recycling.

TABLE 3

PERCENT OF RESPONDENTS RECYCLING INDIVIDUAL ITEMS

Edmonton, Calgary & Other Alberta
(N=1,245)

ITEM RECYCLED	OTHER ALBERTA	CALGARY	EDMONTON
Cans & bottles	59.4	73.8	72.2
Newspaper	36.2	53.5	71.5
Plastics	13.2	19.5	36.8
Milk Cartons	3.4	2.8	30.0
Food Cans	8.3	13.6	45.5
Paper Products	10.3	14.4	38.8
Compost Material	4.7	3.3	4.0
Motor Oil	1.3	2.3	5.4
Glass Jars/Glass	1.3	1.3	12.1
Clothing/Toys/Furniture	3.6	4.6	3.1

Urban dwellers are much more likely to recycle cans and bottles than individuals in rural or small town areas (Other Alberta). About 72 percent of both Edmonton and Calgary respondents said they recycle cans and bottles, while only 59 percent of the rest of the province did (x^2 = 25.39, $p < .001$). This significant difference is likely related to the relative scarcity of bottle return depots in small towns and rural areas, which would lend support to the hypothesis that institutionalized mechanisms for pro-environmental behaviour are an important determinant of that behaviour.

Even in the absence of a curbside recycling program, over half (53.5 percent) of the Calgary respondents said they recycle newspapers, while only 36 percent of the rest of the province do so. It is possible that there are more newspaper recycling bins to which individual can take their newspapers in Calgary than in the rural areas. A full 72 percent of Edmonton respondents recycle their newspapers (differences are significant, x^2 = 103.40, $p < .001$). On an individual item basis, Edmontonians are about 16 percent more likely than Calgarians, and 22 percent more likely than rural residents, to recycle plastics (x^2 =68.53, $p < .001$); and about 30 percent more likely than either group to recycle milk cartons, food cans, other paper products (x^2 test shows all differences significant at $p < .001$). These are all items which can be placed in the Blue Boxes for pickup. There are no significant differences between groups in recycling composting material.

As expected, there are explicit differences in the average number of items recycled by region. Analysis of variance shows that Edmontonians on average recycle about

3.75 items, while Calgarians recycle about 2.12 items, and other Alberta about 1.84 ($F = 167$, $p < .001$). Differences in RECYCLE by political party are not large in magnitude, but Progressive Conservatives recycle the least (2.30 items), and those of the NDP persuasion recycle the most (2.86 items). The Liberals and Reform party members are in the middle at 2.60 items ($F = 3.129$, $p < .025$).

Within Edmonton, there appears to be a "carry over" or "generalization" effect of the Blue Box program to people without access to the program. When an analysis of variance is done selecting only respondents from across Alberta in multi-family dwellings (none of whom had been provided with a blue box), Edmontonians still recycle more than their counterparts in other parts of Alberta. Edmontonians in multi-family dwellings with no access to Blue Boxes recycle about 2.23 types of items on average, Calgarians about 1.90 items, and Other Alberta residents about 1.74 items ($F_{2,259} = 4.02$, $p < .019$).

RECYCLE does not correlate strongly with any but the regional variables (Appendix D). Interestingly, AGE correlates *positively* with RECYCLE ($r = .12$, $p < .000$; $r^2 = .014$) but shows a slight negative correlation with CONCERN with $r = -.07$, $p < .012$; $r^2 = .005$). Although older people tend to be somewhat less concerned about the environment, they do recycle more -- i.e., their attitudes are less pro-environmental than their behaviour. However, the magnitude of the correlations (as indicated by r^2) is extremely small. Age explains about 1.5 percent of the variance in RECYCLE, but less than 1/2 of 1 percent of the variance in concern. This very small effect may be a period effect, given that many of today's older people have lived through at least one war and perhaps a depression, necessitating careful conservation and re-use for survival.

As expected, RECYCLE shows positive correlations with EDMONTON, due to the Blue Box program, and negative correlations with CALGARY and ALBERTA. The only other correlation of note is with education (EDUC), $r = .11$, showing a weak, but positive, relationship between education and recycling. As well, RECYCLE correlates positively with NDP, indicating those of the NDP persuasion are more likely to recycle than others, however, given that most NDP members are in Edmonton, this relationship may be spurious. In any event, it is not strong with $r = .11$ and $r^2 = .012$.

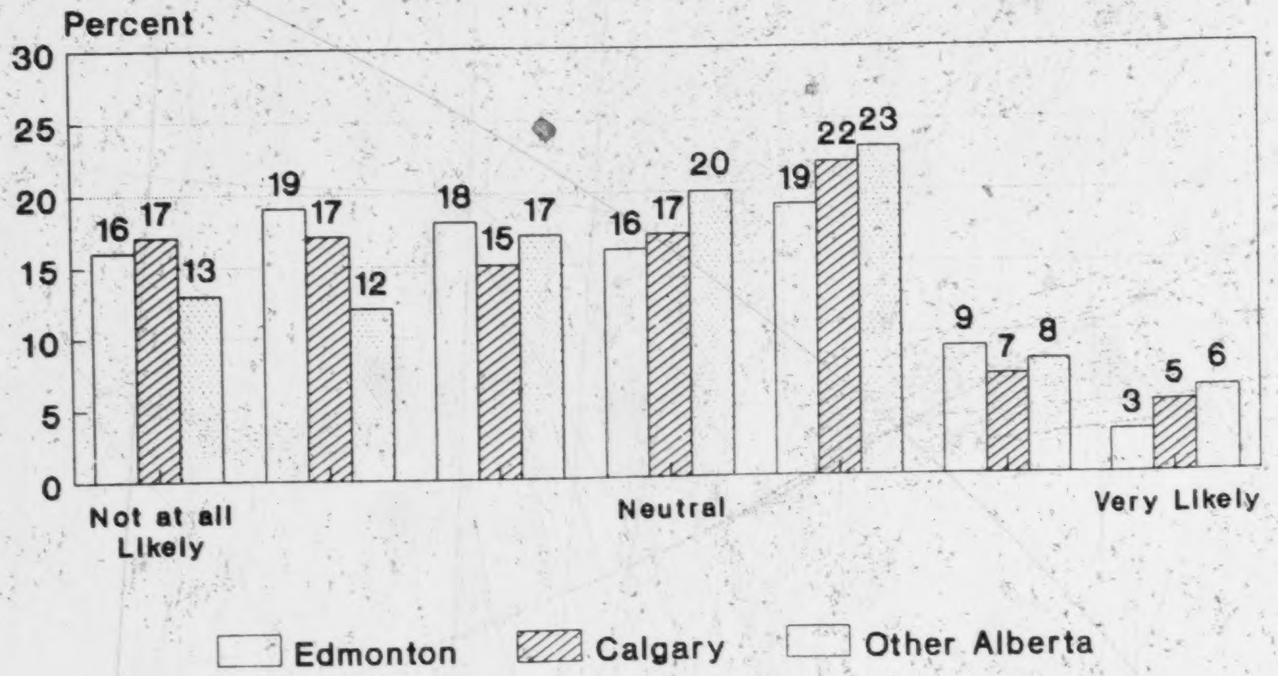
3. Additional environmental indicators

Respondents display a degree of ambivalence about the likelihood of solving the earth's environmental problems in the next ten years. The mean score was just over "neutral" at 3.61, with a "7" being the most optimistic response. Figure 2 shows that, in contrast to the CONCERN distribution (Figure 1), the scores for OPTIMISM are more evenly distributed; nevertheless very few respondents feel that a solution to

Figure 2

Optimism - solving environment problems

Edmonton, Calgary & Other Alberta



N = 1245. Means: Edmonton 3.42; Calgary 3.51, Other Alberta 3.77. ANOVA shows differences significant at $p < .001$.

environmental problems within ten years is very or quite likely. About 5 percent of the total sample feels a solution is very likely, and about 8 percent feel it is quite likely. This pattern differs from the CONCERN distribution in that 56 percent of the sample are clustered around the neutral, or "equally optimistic and pessimistic" point.

An analysis of variance shows significant differences in optimism by area ($F_{2,1204} = 4.92$, $p < .007$), with Edmontonians being the least optimistic (mean = 3.42), Calgarians being slightly more optimistic (mean = 3.51) and rural/small town residents being the most optimistic (mean = 3.77). This is interesting because only the Edmonton area has institutionalized a mechanism for dealing with one type of environmental problem, yet its residents are the least optimistic. However, the difference between most optimistic and least is only 1/2 point on the seven point scale, and is not large enough to be important.

OPTIMISM, like CONCERN, does not display any large correlations with any of the other variables (Appendix D). However, it does correlate $r = -.12$ with SEX, indicating that women are slightly less optimistic than men. As well, OPTIMISM and TRUST are correlated with $r = .34$, indicating that increased trust in government's ability to deal with environmental problems is positively associated with optimism. It is possible that those displaying high levels of TRUST and OPTIMISM are the truly unconcerned people, since possessing information about both environmental problems and governments does not at first glance rationally lead to the responses of trust and optimism.

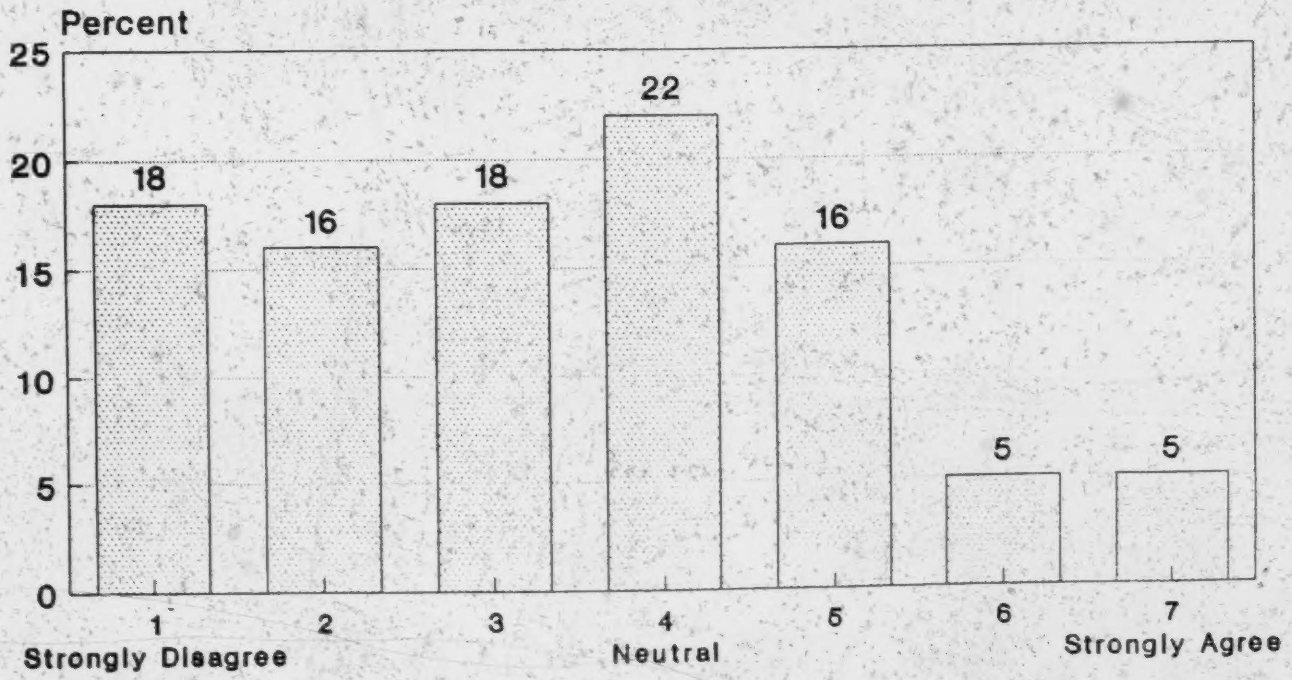
To use OPTIMISM as an alternate measure of environmental concern, it must be argued that those who are the most concerned are also the most familiar with the magnitude of global environmental problems, and therefore the least optimistic about a quick solution. Interestingly, when "Optimism" is regressed on the regional variables and sex, age, education and income, the only significant slope is that for sex, with men being about 1/3 of a point less optimistic than women. None of the other variables in the equation approach statistical significance. This relationship holds when controlling for political affiliation instead of region. Men are still about 1/3 of a point less "optimistic" than women.

While asking respondents how much they trust their government to handle environmental problems does not provide an unambiguous measure of environmental concern (Van Liere and Dunlap, 1980:188; Althoff and Greig, 1977), it does provide some interesting information. When TRUST is crosstabulated with political party, Conservatives are the most likely to trust the government to deal with environmental problems, followed by Liberals, NDP, and the Reform party showing the least trust. TRUST correlates positively with Progressive Conservative, and negatively with the other political parties. The frequency distribution for the variable TRUST is given in Figure 3.

Respondents were also asked "How do you usually dispose of things like paint, turpentine and other cleaning solvents"? Responses varied from "Don't use them" to "store them in the garage or basement" to "pour them in the drain or the ground".[6] Of the people that report using these products, about 32 percent report safe disposal either through a disposal site or the Toxic Roundup. About 36 percent simply throw the unused portions in the garbage, and about 7 percent total pour them down the drain, or pour or bury them in the ground. Approximately 18 percent report using the products up, however, this is not necessarily "safe disposal" since the empty containers which still contain toxic residues are probably thrown in the garbage or abandoned in a basement or garage. In fact, 5 percent report that they do not dispose of the products, but simply leave them in their garage or basement (Figure 4).

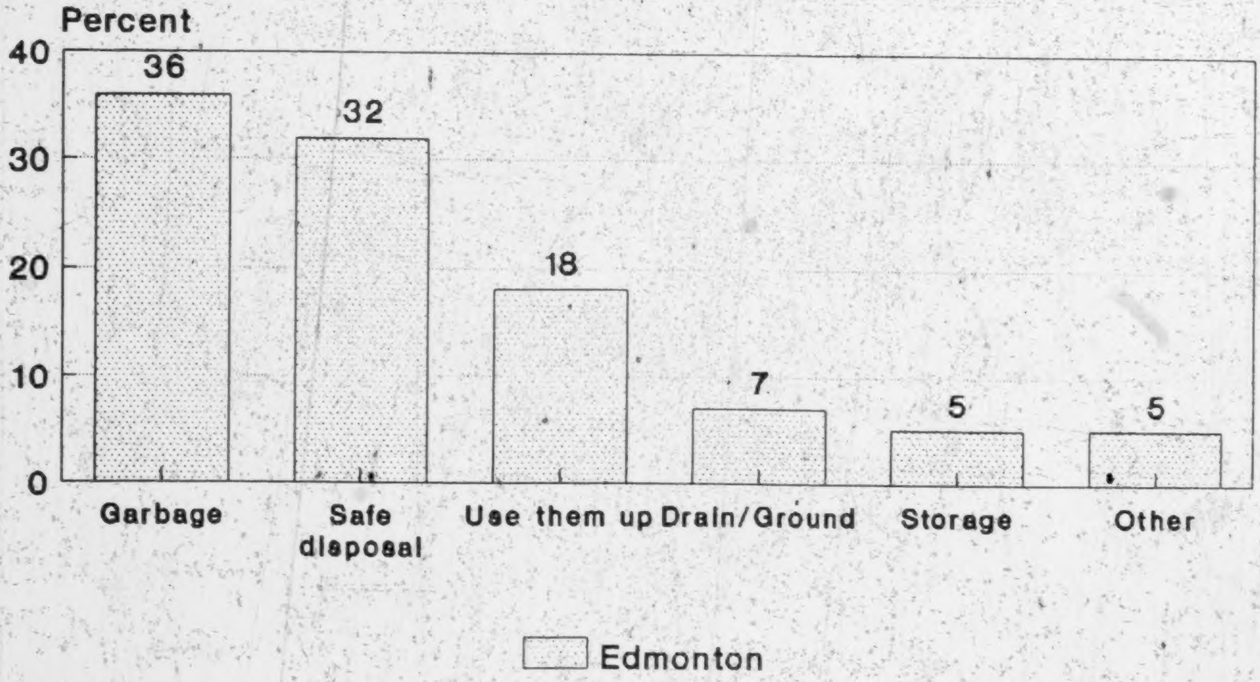
On average, individuals are somewhat, but not extremely, concerned with food safety (mean = 4.84; Figure 5). With a number of large pulp mill developments planned for Northern Alberta, the potential environmental damage and economic benefits of this type of development have been a contentious topic in Alberta. Edmonton respondents do not feel that benefits of pulp mill development are worth the environ-

Figure 3
Trust government to manage
environmental problems



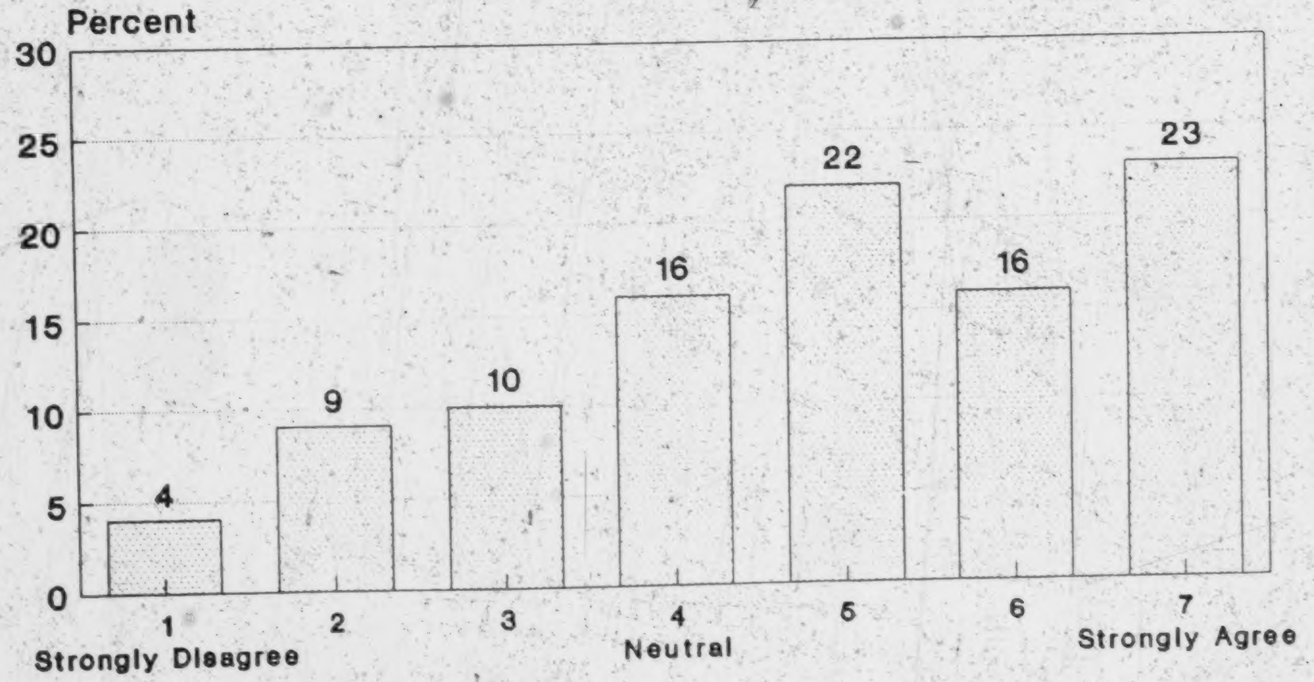
N = 1245. Question: "I trust the Alberta government to manage environmental problems adequately".

Figure 4
Disposal of Household toxics
Edmonton



Valid N = 307. Respondents who do not use these products were excluded (N = 129).

Figure 5
Percent believing food is unsafe because of additives (Edmonton)



N - 443. Question asked: 'Our food is becoming unsafe because of additives'. Mean - 4.835, Standard Dev. - 1.753

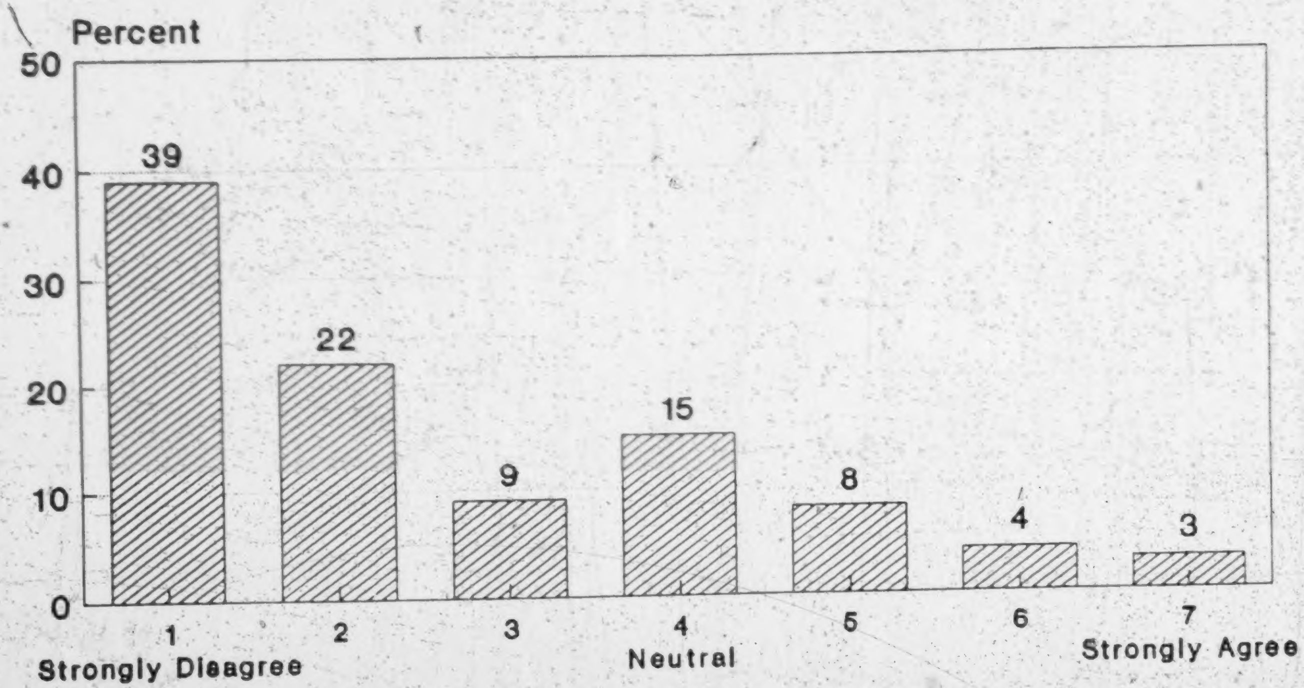
mental risks (mean = 2.56; Figure 6). Thirty-nine percent of respondents feel very strongly about the issue, and almost 70 percent show some level of support for the environment over pulp mill development.

The choice between job creation and environmental protection is more difficult for respondents. When asked whether "Protecting the environment is more important than creating new jobs in Alberta", the mean of 4.96 shows that while Edmontonians lean towards environmental protection, more than 1/4 of the respondents are ambivalent, indicating that they favour environmental protection and job creation equally (Figure 7).

For an economic decision closer to home, Edmontonians were asked to "think about a product in a grocery store or a hardware store that usually costs you ten dollars. If an environmentally safe alternative to that product was available, how much more money would you pay for it?" Figure 8 shows that on average Edmontonians are willing to pay about $1.50 more for "green" products (an additional 15 percent), but there is wide variation, with 12 percent not willing to spend any extra, and 14 percent willing to spend $5 or more extra.

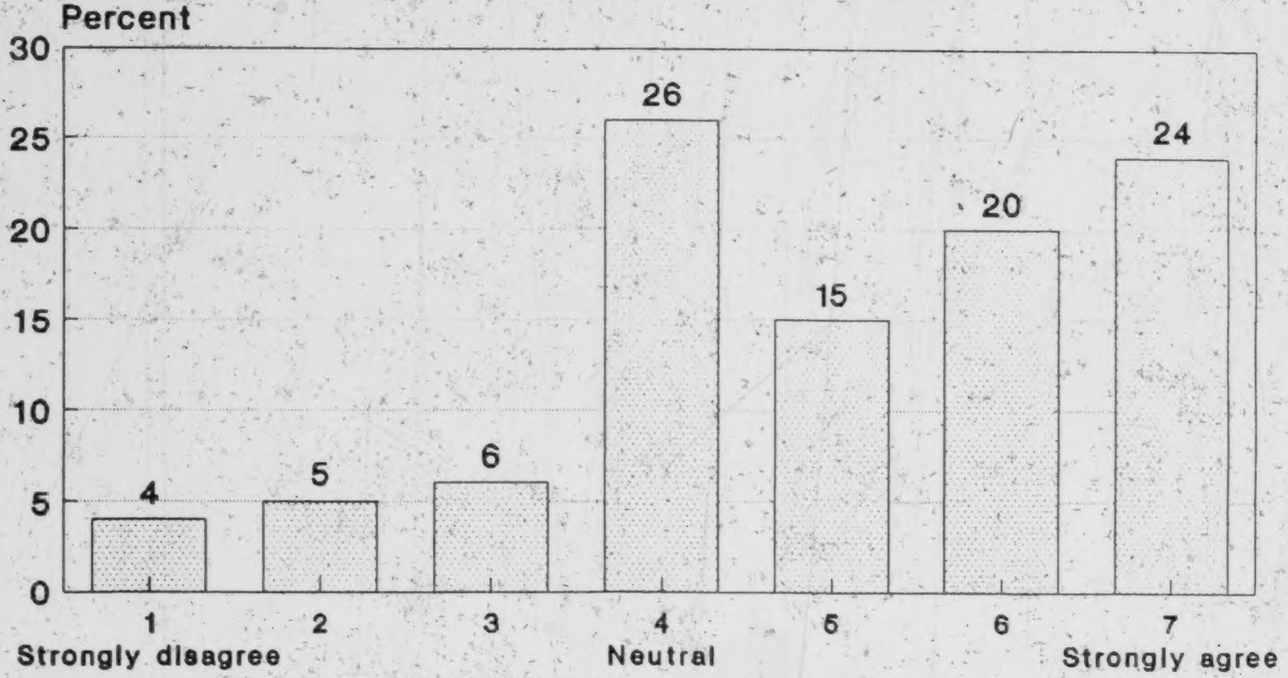
The frequency of various protective and energy conservation behaviours which are more or less under the control of the respondent varies widely (Figure 9). The mean for sun protection is almost midway between "never" and "always"

Figure 6
Pulp mill benfits are worth the
environmental damage they may cause



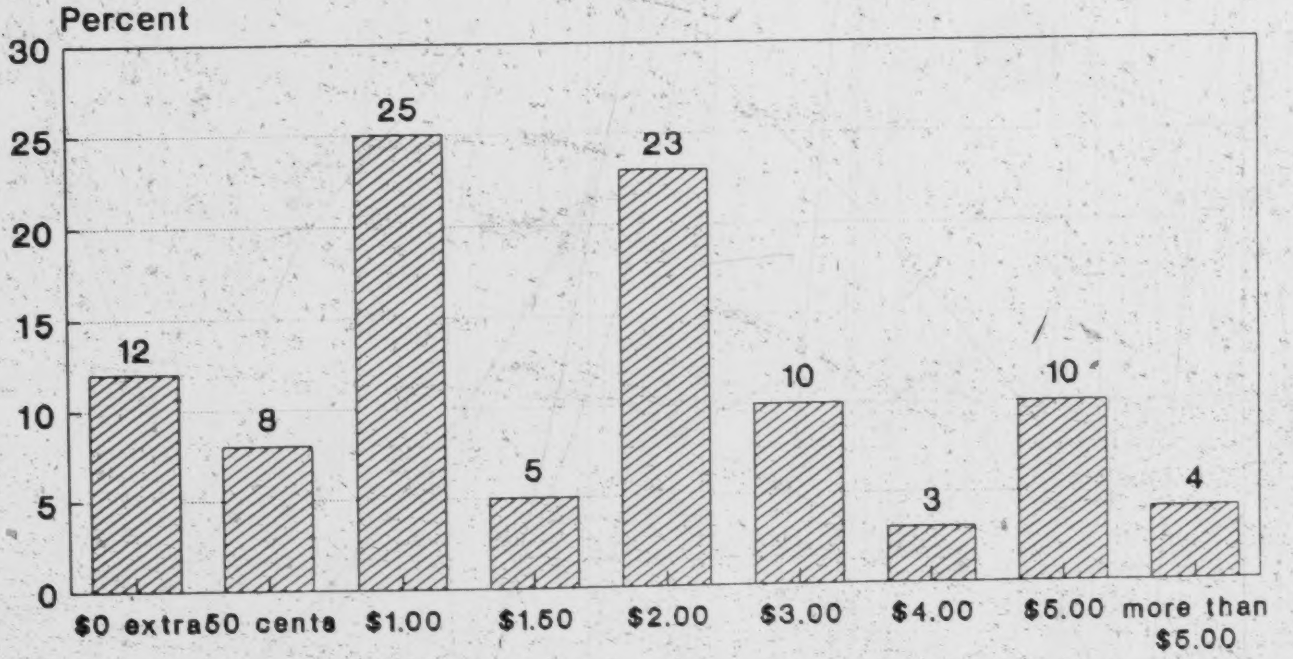
N = 428. "The benefits from new pulp
mills (royalties, taxes, jobs) are worth
the damage they may cause to the envir.

Figure 7
Protecting environment is more important than creating new jobs



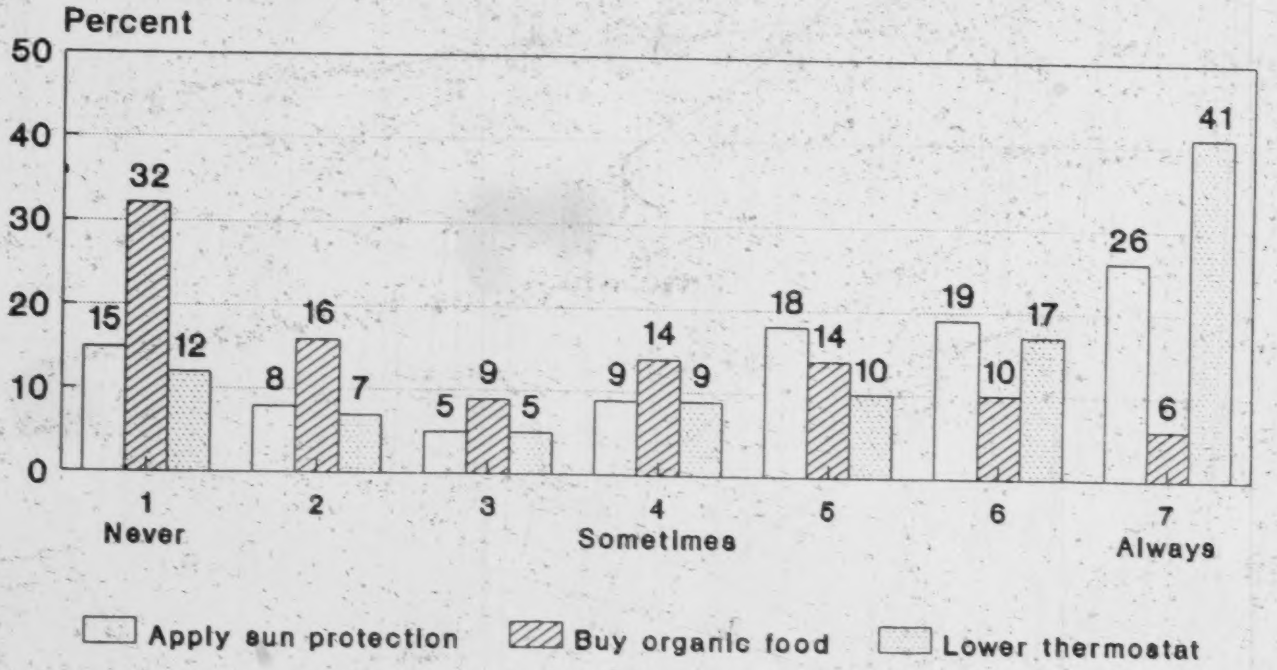
N = 438. "Protecting the environment is more important than creating new jobs in Alberta". Mean = 4.957.

Figure 8
Extra money people will spend for green alternative to regular $10.00 product



N = 419. Question asked how much extra people would spend for a "green" alternative to a regularly purchased product

Figure 9
Frequency of protective and
conservation behavior



Sun protection: N = 448, mean = 4.7.
Purchase organic food: N = 439, mean 3.1
Reduce thermostat: N = 441, mean = 5.1.

(mean = 4.66), with about 1/4 of the respondents "always" using sun protection, and about 15 percent never using it. While there was some concern over food safety, the purchase of organic foods is quite low (mean = 3.15). One third of the respondents never purchase organic foods, and a further 25 percent seldom do -- perhaps due to their limited availability in the Edmonton area. Many people conserve energy by turning down their thermostats at night, with 68 percent of the sample always or almost always turning them down.

E. T-tests for differences between means: Low concern versus High concern

Although the correlation between environmental attitude and behaviour is generally low, the important question is how, or under what conditions, attitudes are transformed into behaviour. While concern about the environment is uniformly high, there are a small number of people who report either a low level or a total lack of concern. It is interesting to look at who these people are, and how they differ from the large majority of the respondents who express high levels of environmental concern.

To examine the difference between the concerned majority and the unconcerned minority, CONCERN was recoded into two groups: those with low or neutral scores on concern (between one and four, inclusive); and those with high levels of concern (5, 6, and 7 on the original scale). This yielded approximately 144 people with low concern (about 11 percent of the total sample), and approximately 1,091 with high concern. The proportion of non-concerned respondents remains at about 11 percent whether the larger 1,245 sample or the smaller Edmonton (N=448) sample is used.

1. Demographic differences

T-tests for the difference between means show that the two groups do not differ in age or income, but the low concern group does have slightly lower job prestige (Blishen scale, $t = -3.05$, $p < .003$). The low concern group also has about 3/4 of a year less education, on average, than the high concern group (Low = 7.76 or high school, High = 8.52 or some technical school, $t = -3.50$, $p < .001$).

2. Attitudinal and behavioural differences

There is no difference between the low concern and high concern groups in the optimism felt over the probability of successfully dealing with the earth's environmental problems in the next ten years (Table 4). Both low concern and high concern respondents are somewhat ambivalent, or not very optimistic, with a mean of 3.5 on the 7 point scale (with 7 being optimistic, or "very likely"). There is also no difference in the degree to which the groups trust the provincial government to deal with environmental problems.

Table 4
Differences in attitude and behaviour: Low concern versus High concern[1]

QUESTION	**N** Low High	**LOW CON-CERN MEAN**	**HIGH CON-CERN MEAN**	**T-**	**P <**
Likelihood of solving envir. probs in next 10 yrs. (7=V. Likely)	134 1075	3.42	3.58	-0.98	.003
Trust govt. to manage envir. probs (7 = SA)	140 1079	3.54	3.32	1.37	.171
Pulp mill benefits worth environmental damage (7 = SA)	52 376	3.63	2.41	4.37	.000
Protecting envir. more imp. than new jobs in Alberta (7 = SA)	53 385	4.53	5.02	-1.99	.051
Believe food is becoming unsafe because of additives (7 = SA)	53 390	4.55	4.87	-1.18	.243
Amount extra will pay for "green" alternative products	47 372	3.72	4.50	-2.26	.028
Protect self from sun (7 = Always)	55 393	3.78	4.78	-3.03	.004
Purchase organic foods (7 = Always)	53 386	2.28	3.26	-4.10	.000
Conserve energy by turning down thermostat at night (7 = Always)	53 388	4.70	5.19	-1.46	.148
PEOPLE W/ BLUE BOXES: Average number of items recycled	26 226	3.46	4.62	-3.13	.004
NO BLUE BOX: Average number of items recycled	11 113	2.45	2.20	0.53	.605

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[1] All t-tests and associated p-value are given for separate estimates of the group variances.

The low concern mean is 3.54, and the high concern mean is 3.32, but this difference is neither statistically significant nor theoretically important, indicating both groups, on average, tend not to place a high degree of trust in the government's ability to deal with environmental problems.

Since several environmental questions were asked only of the face-to-face Edmonton sample, the Ns for the groups change again. The low concern N for the next several questions is approximately 53 (about 12 percent of the Edmonton sample), and the high concern N is approximately 390 (the actual Ns differ very slightly on each question due to missing data).

Both groups agree, but not strongly, that food is becoming unsafe because of additives. Differing levels of concern are not reflected in a difference in energy conservation behaviour (turning down thermostats at night) -- both groups, on average, frequently turn down their thermostats. There are, however, some striking attitudinal and behavioural differences between these two groups on the remaining items.

Attitudinally, the low concern group is more likely to feel that benefits from pulp mills outweigh the environmental damage, and are less likely to believe that protecting the environment is more important than job creation. Regarding pulp mills,[7] on a 7 point scale where "1" is the extreme pro-environmental response, the low concern mean is 3.63, and the high concern mean is 2.41. This is an average difference of 1.2 points between the groups (T = 4.37, p < .001), and indicates that those with low environmental concern are more likely to feel benefits from pulp mills outweigh the environmental damage they may cause.

Respondents were also asked to agree or disagree with the statement "protecting the environment is more important than creating new jobs in Alberta" (where 7 is the highest pro-environmental response). The low concern group's average score on this question is 3.72, while the high concern group is 4.50 (T = -1.99, p < .051), showing that the low concern group places less emphasis on environmental protection than does the high concern group. We may extrapolate to state that the low concern group would tend more to favour job creation over environmental protection.

Behaviourally, the low concern group is significantly less likely to take steps to protect themselves from the sun, less likely to try to purchase organic foods, and less willing to pay extra money for "green" products. While the low concern group will spend extra money for environmentally safe alternatives to regular products, the amount of money they will hypothetically lay out is, on average, about 50 cents less than the high concern group. The low concern group will pay, on average, an extra $1.25 for a "green" product, while the high concern group will pay an extra $1.75 (T = -2.26, p < .028). Respondents were asked to rate how frequently they take steps to be careful about protecting themselves from the sun, and how often they try to purchase organically grown foods. On a 7 point scale (where 7 = "always"), the low concern group mean for sun protection is 3.78, while the high concern mean is 1 full point higher at 4.78 (T = -3.03, p < .004). While neither group are frequent purchasers of organic foods (due perhaps more to the lack of supply than concern), the low concern average is 2.28 (on the 7 point scale), while the high concern average is again 1 full point higher at 3.26 (T = -4.10, p < .000).

3. Differences in recycling behaviour

An important pro-environmental behaviour is the recycling of household garbage. In the city of Edmonton respondents in single family dwellings have access to the "Blue Box" program, in which their sorted garbage is picked up with the regular garbage for recycling. Multi-family residences and apartment dwellers do not have access to this program, providing a type of natural experiment in which we can see the influence of various factors on recycling behaviour. *In homes with access to Blue Boxes,* the low concern group recycles significantly fewer types of items than do the high concern respondents. On average, low concern respondents recycle 3.46 items, while high concern respondents recycle about 1.2 more items -- on average 4.62 (T = -3.13, p < .004). Interestingly, in the absence of a

Blue Box, there is no difference in the number of items recycled for respondents of either low or high concern (Table 4). People without access to a blue box recycle a little more than 2 types of items, on average.

Table 5 shows the effect of both housing type and environmental concern on recycling behaviour for each of the three regions. In rural Alberta and Calgary, where recycling is not as accessible or as well organized as in Edmonton, environmental concern did not affect number of types of items recycled. As well, in rural Alberta house type did not have a large effect as single family dwellers recycle only about .10 more types of items than do multi-family dwellers. Calgarians recycle slightly more than the rural residents, and here the effect of dwelling is more pronounced, although still small: single family dwellers recycle about 1/3 more types of items than single family urban dwellers. Being in an urban area and a single family dwelling has a slight positive effect on recycling behaviour, although the most important and interesting result is that environmental concern has no direct effect on behaviour in these areas.

Table 5
Mean number of types of items recycled

HOUSING TYPE	ALBERTA	CALGARY	EDMONTON	
			CONCERN	
			LOW	HIGH
MULTI-FAMILY	1.74	1.90	2.45	2.20
SINGLE FAMILY	1.85	2.23	3.46	4.62

In Edmonton recycling behaviour is higher on average than in the two other areas of the province, perhaps due to the publicity given to the popular Blue Box recycling program. Residents in multi-family dwellings (who do not have access to Blue Boxes) recycle about the same number of types of items as *single family dwelling* residents in Calgary -- about 1/3 more of an item than people in the rest of the province. Interestingly, in Edmonton environmental concern has little effect on recycling behaviour for those in multi-family dwellings, i.e., those without access to the institutionalized recycling program. Whether individuals are concerned about the environment or not, they recycle on average a little over two types of items.

The most striking difference between concerned and unconcerned individuals occurs in single family dwellings in Edmonton, i.e., those individuals with access to Blue Boxes. These are the individuals which are in a social context which may promote recycling. In Edmonton, concerned people recycle

However, unconcerned people still recycle about 3 1/2 types of items. In other words, even if people are not concerned about the environment they still use their Blue Boxes to recycle.

This may indicate that environmental concern has problems overcoming the difficulties encountered in most social contexts in recycling household waste. Although high concern residents are probably more willing to recycle than low concern residents, in the absence of a Blue Box or similar program this attitude does not translate into behaviour. It is also clear that concern does not totally control behaviour. Where there is access to a Blue Box, low concern residents still recycle and utilize their Blue Boxes, albeit to a lesser degree than high concern respondents. It seems that the simple presence of the mechanism (the Blue Box program) means that the behaviour will occur. Concern acts only to enhance an existing structure or mechanism, but does not overcome the lack of one. Concern is not necessary for the pro-environmental behaviour to occur. The existence of a mechanism, i.e., the social context, seems sufficient to cue the behaviour.

These results also show that there may be an important link between personal attitude and personal protective behaviour. There is evidence to show that those who are most concerned about the environment take more steps to protect themselves. When people with low levels of concern are compared to those with high concern, the high concern group on average reports a higher frequency of protective behaviour. However, while concern will enhance an existing pro-environmental behavioural program, environmental concern alone is not enough to overcome "structural" barriers such as those involved in recycling household waste. Concern can make a difference in behaviours subject to individual control, such as application of sunscreen and the purchase of "green" products.

In conclusion, while there appear to be important differences in both the attitudes and behaviour of people who report little or no concern with environmental issues, it must also be remembered that very few people (11 percent in this sample), reported a low level of concern over the environment.

It is possible that individual levels of environmental concern vary more than they appear to in survey data. However, measurement of this variation would probably require a different methodology. As shown in Appendix A, distributions of environmental concern show a remarkably consistent pattern. The problem with attempting an alternate measure of concern with survey methodology is the tendency to link "real" concern with action. We have shown, however, that the link between concern and action is not necessarily one under total individual control.[8]

F. Multiple Regression Analysis of Environmental Concern and Recycling behaviour

Two multiple regressions are reported below, one for CONCERN and one for RECYCLE. Both regressions include the "standard" predictors of age, sex, education, income and occupational prestige.

1. Environmental concern

General environmental concern was regressed on age, sex, education, income, job prestige and rural/urban residence (EDMONTON, CALGARY, ALBERTA). As well, RECYCLE was included since engaging in pro-environmental behaviour such as recycling may affect concern over the environment.[9] OPTIMISM over the likelihood of solving the earth's environmental problems in the next ten years was also included as a predictor. These variables will test the major hypotheses cited by Van Liere and Dunlap (1980), as well as the possible effects of recycling behaviour and optimism on CONCERN.

While the literature is equivocal on the strength (or existence) of relationships between socio-demographic variables and environmental concern, we would expect to see a negative relationship between concern and age, a positive relationship with education, and little or no relationships with income and occupational prestige. As well, no sex differences are expected.

As predicted above, Table 6 shows that less than 1 percent of the variance in CONCERN is explained by the independent variables. The F test ($F_{10,826} = 1.32$, $p < .218$) shows that none of the slopes differ significantly from zero. The R^2 for the regression is only .016, with the adjusted R^2 equal to .004.

Table 6
Slopes, Standard Error and Significance Levels for multiple regression of CONCERN

VARIABLE	SLOPE (b)	Standard Error (b)	p-value
AGE	-.0047	.0031	.6966
EDUC	.0129	.0182	.4803
INCOME	-.0019	.0066	.7697
PRESTIGE	.0000	.0000	.8900
SEX	-.0225	.0951	.8128
OPTIMISM	.0097	.0248	.6966
RECYCLE	.0095	.0599	.8748
CALGARY	-.3533	.2070	.0883
CALGRECY	.1745	.0896	.0517
EDMONTON	-.1536	.2072	.4589
EDMRECY	.0383	.0707	.5877
Adjusted R^2 = .00376, Standard Error = 1.19952			
$F_{10,826}$ = 1.315, Signif F = .2175			

In other words, we are unable to explain much of the variance in environmental concern using these variables. The correlation matrix (Appendix D) shows that there are no collinearity problems. Indeed, there is a paucity of even small correlations between the independent variables and the dependent variable CONCERN. Concern is uniformly high at across all ages, social classes and regions.

2. Recycling behaviour

We predict that older people and those with more education will recycle more types of items on average. Further, although theoretically those individuals with high levels of concern should demonstrate higher levels of recycling (Dunlap, 1983), our Hypothesis 5 predicts that concern will have no direct effect on recycling behaviour but will demonstrate an effect in social contexts where a regular, ongoing recycling program is available (single family dwellings in Edmonton).

RECYCLE was regressed on the standard predictors of age, sex, education, income, job prestige and political party. Progressive Conservatives were used as the reference group, with LIBERAL, NDP and REFORM (political party preferences) entered as dummy variables. Both indicators of environmental concern were included in the analysis (CONCERN and OPTIMISM). The regional variables (EDMONTON, CALGARY and ALBERTA) acted as an indicator of macro structural variation. Further, since within Edmonton only single family and side-by-side duplexes have access to the Blue Box program, a dummy variable for HOUSE was entered (single family dwelling = 1).

Since we predicted (Hypothesis 4) that the effect of the socio-demographic variables may depend on structural conditions, the regressions were performed separately for the three regions. Results showed that the slope for education achieved statistical significance only in Edmonton. While the interaction was not strong enough to merit inclusion in the reduced form model, it does provide support for the hypothesis that personal resources are not strong enough to overcome structural barriers to pro-environmental behaviour, but their effect is enhanced by some social structural conditions. As well, results showed a definite interaction for single family dwellings, with this effect stronger in Calgary than rural Alberta, and stronger in Edmonton than Calgary. This makes sense given that individuals in homes have more space for storage of recyclable goods than apartment dwellers, and urban dwellers have more access to recycling depots and bins than rural respondents.

3. Reduced form model

Sex, income, job prestige, political party and optimism did not contribute significantly to the model. A reduced form model was estimated including age, education, concern, Calgary, Edmonton, dwellings type, and two interaction terms: a two-way interaction between dwelling type and Edmonton, and a three way interaction between environmental concern, dwelling type and Edmonton.

The correlation matrix shows no collinearity problems, with the largest correlation being between Edmonton and its interaction term HOUSEEDM ($r = .697$). Since the variables included in the regression have different theoretical reasons for inclusion, they were regressed using a stepwise procedure. As predicted, the socio-demographic variables of age and education have very little effect, accounting for only 3 percent of the variance in recycling behaviour. Environmental concern has no significant direct effect; its slope does not achieve statistical significance but it is in the predicted direction ($b = -.33$, $p < .053$). The literature predicts that urban residents will recycle more than rural, and we see that the addition of the urban area of Calgary does have a small effect, accounting for 5.2 percent of the variance and increasing the R^2 to 8.4 percent. However, the effect of a difference in social context on behaviour shows with the addition of Edmonton and the interaction terms. EDMONTON alone provided a significant R^2 change of 20 percent, bringing the adjusted R^2 up to 28.2 percent. HOUSE explains an additional 8.3 percent of the variance in recycle, the interaction term HOUSEEDM adds 5.4 percent, and the final interaction term CONHEDM accounts for only 0.8 percent of the variance in recycle.

The final adjusted R^2 for the regression is .427, which means that the independent variables together account for 42.7 percent of the variance in RECYCLE. An $F_{8,992}$ of 94.2, $p < .000$ shows that at least one of the regression slopes differs significantly from zero.

Table 7
Slopes, Standard Error and Significance Level
for multiple regression of RECYCLE

	VARIABLE	SLOPE (b)	Standard Error (b)	p-value
"MICRO" Hypotheses	AGE	.0118	.0028	.0000
	EDUC	.0477	.0171	.0054
	CONCERN	-.1048	.1461	.4735
"STRUCTURAL" Hypotheses	CALGARY	.2274	.1061	.0322
	EDMONTON	.8872	.1622	.0000
	HOUSE	.3726	.1193	.0018
INTERACTION Terms	HOUSEEDM	1.9310	.1877	.0000
	CONHEDM	-1.1965	.3146	.0002
	Intercept	.7481	.2203	.0007
Adjusted R^2 = .42710, Standard Error = 1.30460 $F_{8,992}$ = 94.19, Signif F = .000				

Table 7 shows that age and education have very weak, positive effects on recycling behaviour, and environmental concern (as measured here) has no significant effect. Age makes a small difference such that, controlling for the other variables in the model, a 20 year old will increase the average number of items recycled by about .24 of an item; and for a 50 year old the increase is about .58 of an item. So the 30 year age difference means the older person recycles about 1/3 more of an item than the younger person. The effect of education is also small: someone with 15 years of schooling will recycle, on average, about 1/2 more of an item than someone with no schooling.

The real differences in the model show when the regions are contrasted. The increased opportunity for recycling provided by an urban context (even one without an organized recycling program) is evident for Calgary respondents, who recycle about .23 more types of items than their rural and small town counterparts. However, the tremendous influence of social conditions on behaviour shows in Edmonton, where the social context for recycling is radically different from the other two areas. Edmontonians in houses recycle on average about 3 more types of items than Calgarians or other Albertans. Edmontonians without access to Blue Boxes still recycle about .89 more of an item than rural Albertans, and about .66 more of an item than Calgarians. This rural/urban difference in itself is quite striking apart from any effect of the Blue Box Recycling program. Individuals in non-metropolitan areas do not recycle as much as urban residents. However, it is possible that rural residents define "recycle" differently than do urban residents. Rural residents are more likely to have to dispose of their own garbage than are urban dwellers, and thus may "reuse" items that urban dwellers would throw away or set aside for a recycling bin.

A result is that is extremely important to our ideas about environmental concern is that concern has an effect on behaviour *only* in a social context which increases the probability of that behaviour (Hypothesis 5). As Table 8 shows, when controlling for the independent variables in the model, environmental concern has little independent effect on recycling behaviour, but it does have an effect in a social context which promotes recycling. For most Albertans, the most important determinant of recycling behaviour is what type of dwelling they live in, suggesting that storage space has a stronger effect on behaviour than does environmental concern. People in single-family homes recycle more than people in multi-family dwellings, whether or not individuals have access to a recycling program.

In Edmonton, in the absence of a Blue Box, the multivariate analysis shows that people with low levels of concern recycle quite a bit less than those with high levels of concern. However, concerned Edmonton residents without access to a Blue Box recycle far more than their Calgary and rural counterparts. It is possible that in Edmonton the publicity given to the Blue Box program spurs even those with no direct access to recycling programs to seek out their own sources for recycling. The number of items recycled by concerned people in multi-family dwellings in Edmonton (about 1.64 items on average) suggests they are probably doing so with pop cans, bottles and newspapers, which are more readily recycled than milk cartons and food cans. Further, the effect

Table 8
Predicted mean number of items recycled*

HOUSING TYPE	ALBERTA	CALGARY	EDMONTON	
			CONCERN	
			LOW	HIGH
MULTI-FAMILY	.75	.98	.44	1.64
SINGLE FAMILY	1.12	1.30	2.74	3.94

*Table 7 includes predicted values for RECYCLE controlling for environmental concern, age, education, income, occupational prestige, dwelling type and location.

of social context on behaviour is such that the desired behaviour occurs even in the absence of environmental concern: unconcerned people with access to Blue Boxes use them to recycle. These individuals recycle about 2.74 items, on average, although this is less than their concerned counterparts who recycle almost 4 different types of items.

In order to see if it was possible to explain variation in recycling behaviour further, the regression was re-estimated but restricted to those with access to Blue Boxes. In this regression age and education were significant at the .05 level of significance, and concern at the .01 level. The slopes for age and education were extremely weak (age: b = .016, p < .032; education b = .094, p < .027). The interaction with concern was strong, with low concern individuals recycling almost 1 item less than concerned respondents (b = - .954, p < .007). In conclusion, there is a weak positive relationship between recycling, age, education and environmental concern, but these variables together account for only 5.74 percent of the variance in recycling behaviour, which shows again that individual characteristics do not explain variation in recycling.

V. CONCLUSION

Several important conclusions can be drawn from this analysis. First, there is little to be gained from attempts to explain differences in environmental concern within society, since high levels of environmental concern appear to have become a cultural constant. If the important question is why some people are concerned and some are not, with current methods of measuring concern, analysis should be cross-cultural to get variation in levels of expressed concern. As well, it may be important to obtain an alternate measure of concern: asking people how concerned they are inevitably results in highly skewed distributions which display low correlations with important variables and fail to predict behaviour. However, it is possible that we are accurately measuring environmental concern in western cultures, and the lack of variance reflects valid, high levels of concern in the population.

Very striking conclusions can be drawn from the analysis of recycling behaviour. First, in the absence of a recycling program, environmental concern does not affect recycling behaviour. People who are concerned about the environment do not recycle any more than those who are not concerned, when there is no structural, or institutional mechanism for them to do so. Second, when a recycling program is present in the area, i.e., when the "norm" in the social context becomes pro-environmental behaviour, concerned people without access to the program will increase their recycling behaviour, while unconcerned people will not. Third, people with access to a recycling program will use it, regardless of their level of concern. The desired pro-environmental behaviour is not dependent on individual environmental concern; people who are not environmentally concerned will still recycle, if they have access to a mechanism for doing so. It is perhaps enough that environmental concern is a cultural constant; it does not need to be a personal commitment as well. This tells us that an individual's environmental concern will enhance the effect of an existing institutionalized structure, but it will not overcome the barriers presented by the lack of structure. High levels of concern further increase the desired behaviour for both people with and without access to the program. The lack of influence of standard socio-demographic and economic predictors supports the hypothesis that social structural factors are an important determinant of pro-environmental behaviour.[10]

The above demonstration that social structural factors are important determinants of pro-environmental behaviour has important implications for environmental sociology. We have attempted to provide a much needed (Buttel, 1987) perspective which utilizes a macrostructural focus but also incorporates subjectivity and agency. An important contribution is the demonstration that environmental attitudes can translate into behaviour only in certain social contexts. However, this analysis does not engage in a truly macro-structural analysis which would locate environmental problems in the wider constitution of western society.

As Catton and Dunlap suggested in their original critique of social theory (Catton and Dunlap, 1978), the ideological biases of western society seem to have prevented the empirical environmental sociology literature from focusing on the big, important questions of the relationship between human beings and their environment. However, the more critical, theoretical literature in environmental sociology has swung too far the other way, forgetting that individual behaviour is affected by social structure, and that both levels of analysis provide needed insights. We have tried here, in a rudimentary way, to begin to forge a link between the micro and the macro, by using the best of both micro and macro theory, incorporating social structure, but attempting to ground it in the everyday lived reality of individuals.

A potential focus for future research is to examine whether the interaction between environmental concern and social structural conditions holds for environmental behaviours other than recycling. Results from this study imply that policy makers would best put their money and emphasis into organized programs and mechanisms, i.e., changing the social context in which people act, rather than attempting to raise levels of concern or focusing on environmental education. People are both aware of and concerned about environmental problems, but translation of this concern and awareness into behaviour requires a context which promotes the behaviour. Indeed, the evidence implies that some social contexts actually decrease the probability that recycling will occur. Further research is required to ascertain whether the link between individual concern and social structure holds for other types of environmental behaviour, social contexts, and with different rural and urban populations.

ENDNOTES

1. Throughout this paper the terms "social structure" and "institutionalized" are used in the following manner. Since the purpose of the paper is to provide a link between individual agency and social structure in the area of individual environmental concern and recycling, social structure is used here as a "macro" term which refers to regularly occurring patterns of behaviour at the community level. Specifically, it refers to the presence or absence of an institutionalized curbside recycling program. "Institution" and "institutionalized" are used simply to describe "social practices that are regularly and continuously repeated" (Abercrombie, Hill and Turner, 1986:110), again with specific reference to the curbside recycling program which is in place in Edmonton, but not in the other two areas examined.

2. This study would have been strengthened by looking at how knowledge and attitudes interact to produce pro-environmental behaviour -- i.e., under what conditions do knowledge of recycling, and pro-environmental attitudes translate into pro-environmental behaviour. However, the structural homogeneity of the sample (all households in the same city, no difference in opportunities for recycling), as well as its small size (87 nonrecyclers and 110 recyclers) would not have supported this type of analysis.

3. The New Environmental Paradigm was originally advanced as a meta-theory which would "revolutionize" the practice of *all* sociology, not just its environmental aspects. It has given rise to both a theoretical and empirical literature, and has had a large influence on the conceptualization and measurement of environmental attitudes and the link to behaviour in sociology. Appendix B provides a critique of this body of work, and examines its utility for the study of environmental attitudes and behaviour.

4. See Appendix C for a complete list of question wordings and coding.

5. All correlations reported are significant at the $p = .01$ level unless noted otherwise.

6. In retrospect, the question lead people to believe that toxic household wastes were restricted to things to do with paint and turpentine, when in reality they include such mundane items as nail polish remover and oven cleaner. It implicitly assumed a knowledge of what products were toxic, and the leading nature of the question may be responsible for the high number (30%) who say they do not use these types of products.

7. The actual question is Question 46(b), asked of all respondents. "Please tell me how much you agree or disagree with these statements. The benefits from new pulp mills (royalties, taxes, jobs) are worth the damage they may cause to the environment." (Scale runs from 1 = strongly disagree to 7 = strongly agree).

8. Possibly an unstructured, active interview situation would allow a different assessment of individual levels of environmental concern, one not necessarily linked to action. Bellah et al (1986) suggest that the types of responses given to public opinion polls are in reality "private" opinion because "[p]oll data sum up the *private* opinions of thousands of respondents. Active interviews create the possibility of *public* conversation and argument. Curiously, [active interviews] stimulate something that could be called public opinion, opinion tested in the arena of open discussion. 'Public opinion polling' does not and might better be called 'private opinion polling'" (Bellah *et al*, 1986:305).

9. If a relationship exists between CONCERN and RECYCLE it may be a reciprocal relationship. This cannot be tested adequately with this model since the model cannot be identified. To identify the model, items would be required which predict CONCERN, but not RECYCLE and vice versa. The regional variables of EDMONTON, CALGARY and ALBERTA would serve to uniquely predict RECYCLE, but as the multiple regression analysis shows, there are no predictors of CONCERN, let alone unique predictors.

10. Participation rates in the Blue Box program do differ across area within the city. In Edmonton, inner city areas with Blue Boxes have lower participation rates and generate a much lower volume of recyclable material than higher income areas. Residents in the upper middle class areas (mostly the southwest part of the city) have inundated city hall with requests for larger blue boxes and to increase the range of items eligible for recycling. City officials say they have been overwhelmed with both the volume of material generated

in these areas, and the care taken in preparing waste for recycling. (Personal communication with Ron Ralt, Acting Project Coordinator, Blue Box Program, City of Edmonton, July 31, 1990). Perhaps, rather than individual level socio-economic indicators affecting behaviour, a broader value system is at work. Areas of the city with high volume and participation rates are also areas with very high property values. People in these areas are willing to pay for the privilege of a beautiful residential environment, and perhaps much more willing to participate in anything which protects or improves the quality of that environment.

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APPENDIX A

Variation in indicators of environmental concern

Survey research shows that recent indicators of environmental concern from various sources (Euro-Barometer 18, Euro-Barometer 25, British Social Attitudes Survey, Gallup Canada, Gallup U.S., All Alberta Study 1990), and covering various substantive environmental issues, have very similar, skewed distributions. The common element is that whatever the indicator, a majority of respondents are "concerned" about environmental issues, or favour environmental protection over economic growth. This appendix reports the frequency distributions on several indicators of environmental concern from various American, European and Canadian data sets.

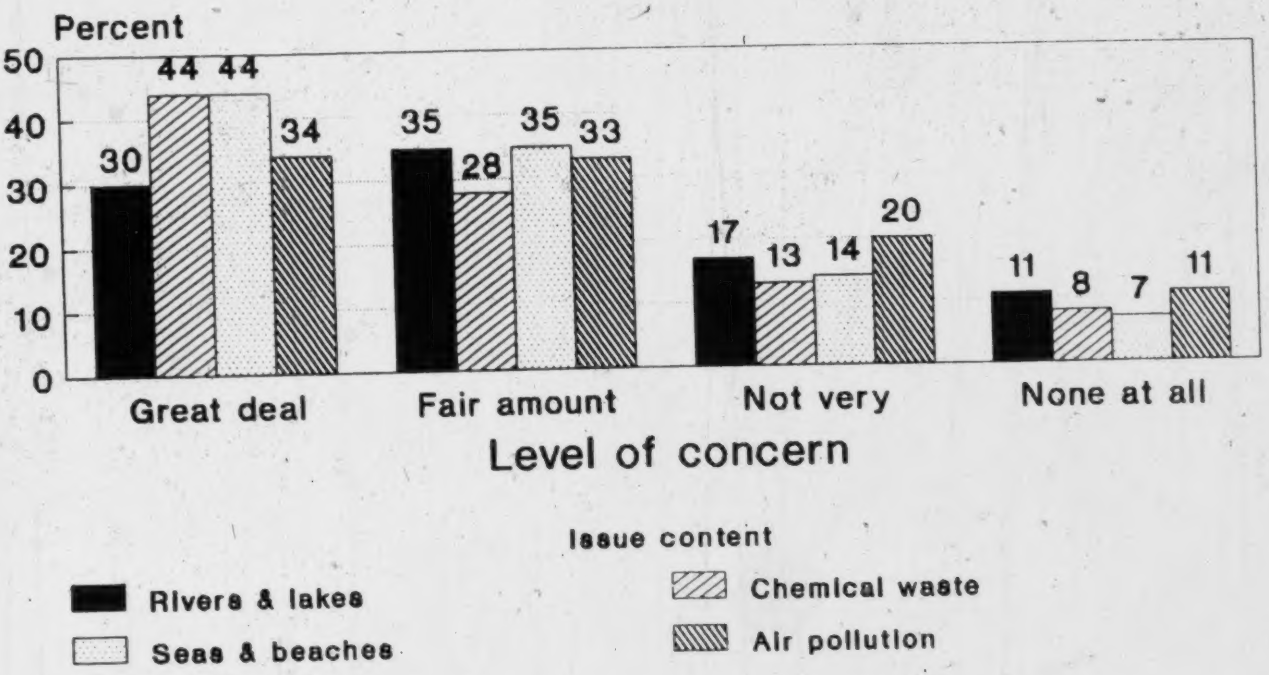
Figure A-1 shows the distributions of four different environmental concern indicators taken from Euro-Barometer 18 (Rabier et al, 1983).[1] For all environmental issues, the sample is clustered in the categories of "Great deal of concern" and "Fair Amount of concern". The topics include concern about pollution of rivers and lakes, damage to seas and beaches caused by oil spills, disposal of industrial chemical waste, and air pollution. Percentages in the "concerned" response category range from a minimum of 65 percent (rivers and lakes), to 79 percent (seas and beaches).

Table A-1 shows the distributions for rating the "seriousness" or magnitude of various environmental problems.

Figure A-1

Environmental Concern

Europe



Source: Euro-Barometer 18:Ecological Issues (Rabier et al, 1983)

(No copywright involved. Data made available in part by Inter-University Consortium for Political and Social Research. See page 108.)

TABLE A-1
British Social Attitudes Survey
Indicators of environmental concern

Question: "How serious an effect on our environment do you think each of these things has?"				
	SERIOUSNESS OF PROBLEM			
ISSUE:	VERY	QUITE	NOT VERY	NOT AT ALL
Industrial waste in the rivers and sea	56	34	7	2
Industrial fumes in the air	43	41	12	2
Waste from nuclear electricity stations	58	24	12	4
Lead from petrol	39	42	16	3
Noise and dirt from traffic	21	46	28	3
Noise from aircraft	6	24	54	14

Source: Witherspoon, Sharon. Question 37 from the British Social Attitudes Survey (1985) Technical Report. Social and Community Planning Research, London.

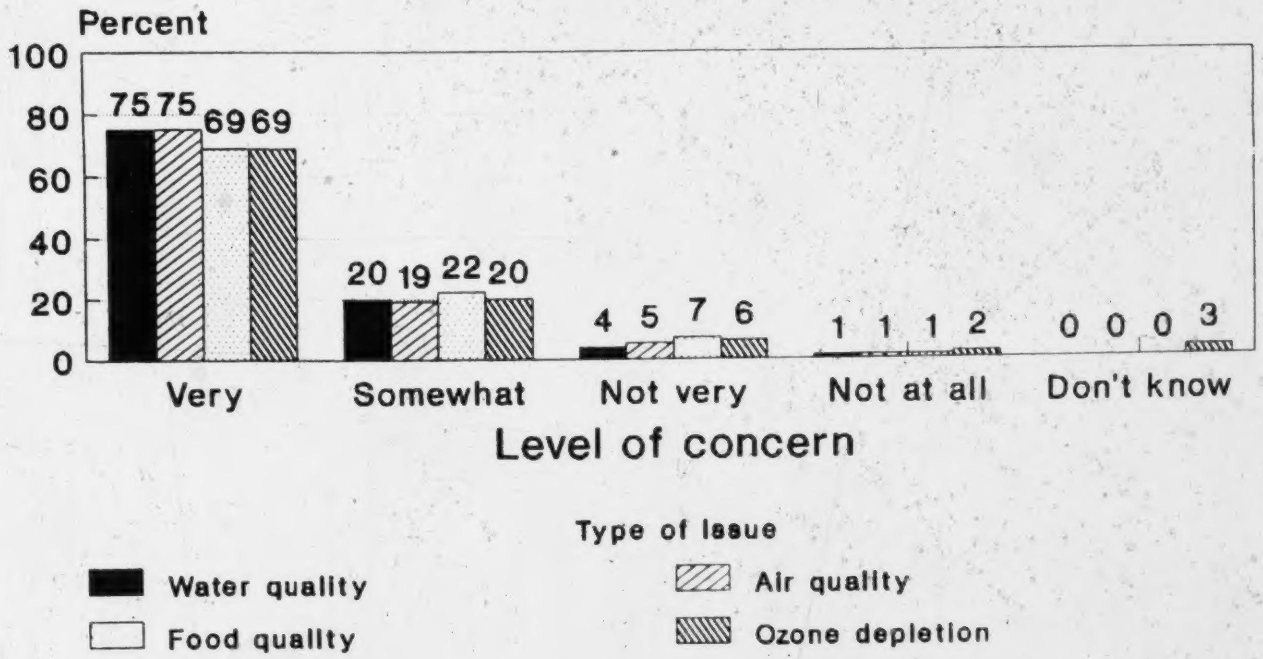
No copywright involved. Data made available in part by Inter-University Consortium for Political and Social Research. See page 108.

This data is drawn from the 1985 British Social Attitudes Survey (Witherspoon, 1985), and shows the same clustered response pattern of the Euro-Barometer data. Seventy-nine percent of the sample felt that lead from gasoline posed a "very" or "quite" serious problem to the environment. Ninety percent felt that industrial waste in the rivers and seas is a serious problem. Eighty-two percent believed nuclear waste to be a serious or very serious problem, and 84 percent were concerned about air pollution. Only 30 percent felt that noise from aircraft is a threat to the environment, and 67 percent felt that noise and dirt from traffic threaten the environment.

Figures A-2 and A-3 show that in October of 1989, Gallup Canada estimated that 95 percent of the Canadian public was "very" or "somewhat" concerned about water quality, 94 percent concerned about air quality, 91 percent concern about food quality, 89 percent concerned about ozone layer depletion, and 93 percent concerned about forest conservation. Eighty-seven percent of Canadians are very or somewhat concerned about soil conservation, and the lowest level of concern is for the greenhouse effect - only 83 percent of Canadians are concerned about this issue (Bozinoff & MacIntosh, 1989a).

Gallup U.S. estimated that in 1988, 64 percent of Americans gave top priority to the environment as a consideration for the next administration, while 31 percent

Figure A-2
Environmental Concern - Canada
Water, Air, Food, Ozone

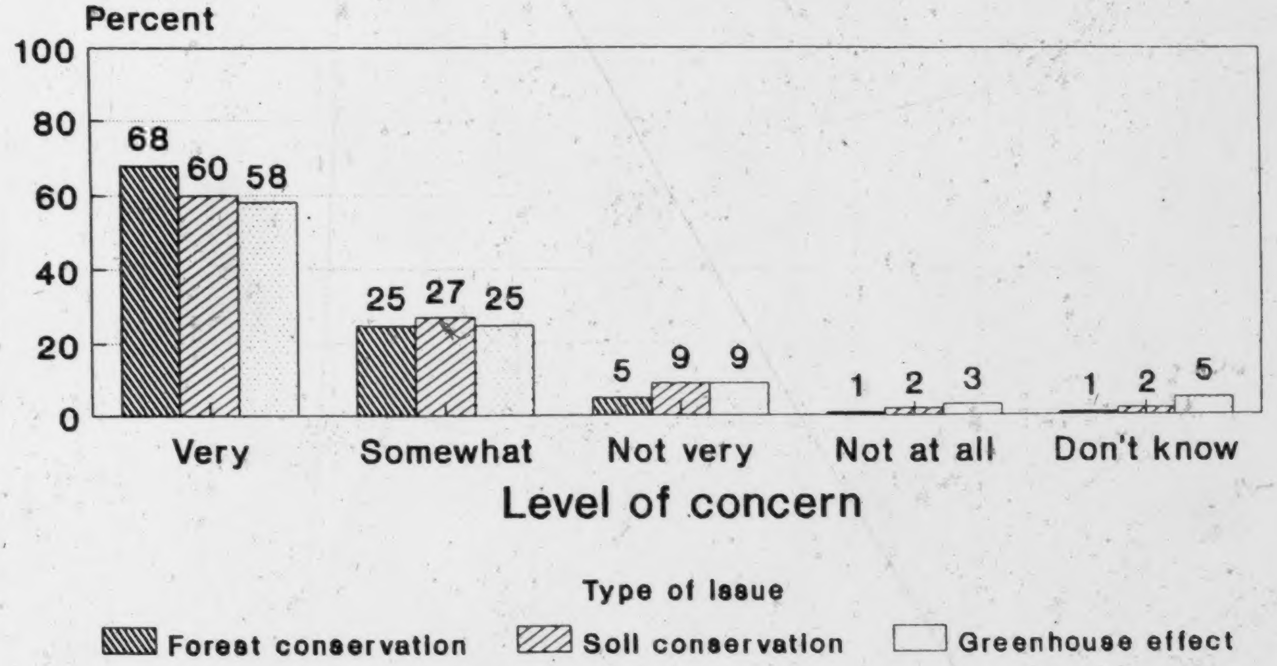


Source: Gallup Canada, Oct. 25/89
(Bozinoff & MacIntosh, 1989a). (No copywright involved.)

Figure A-3

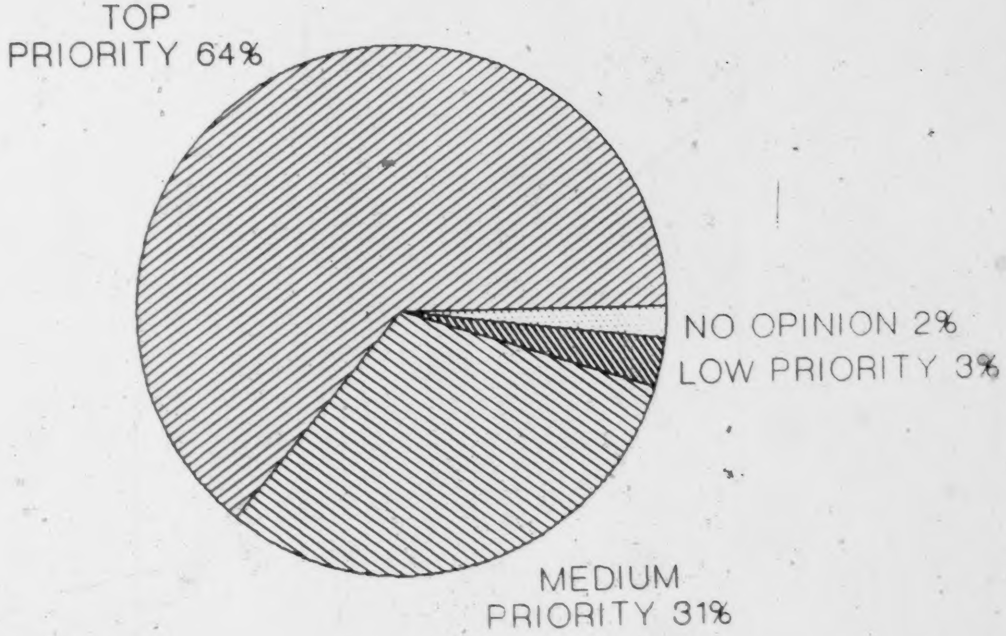
Environmental Concern - Canada

Forest, Soil, Greenhouse



Source: Gallup Canada, Oct. 25/89
(Bozinoff & MacIntosh, 1989a). (No copywright involved.)

Figure A-4
Priorities for next President
Support for laws to protect environment



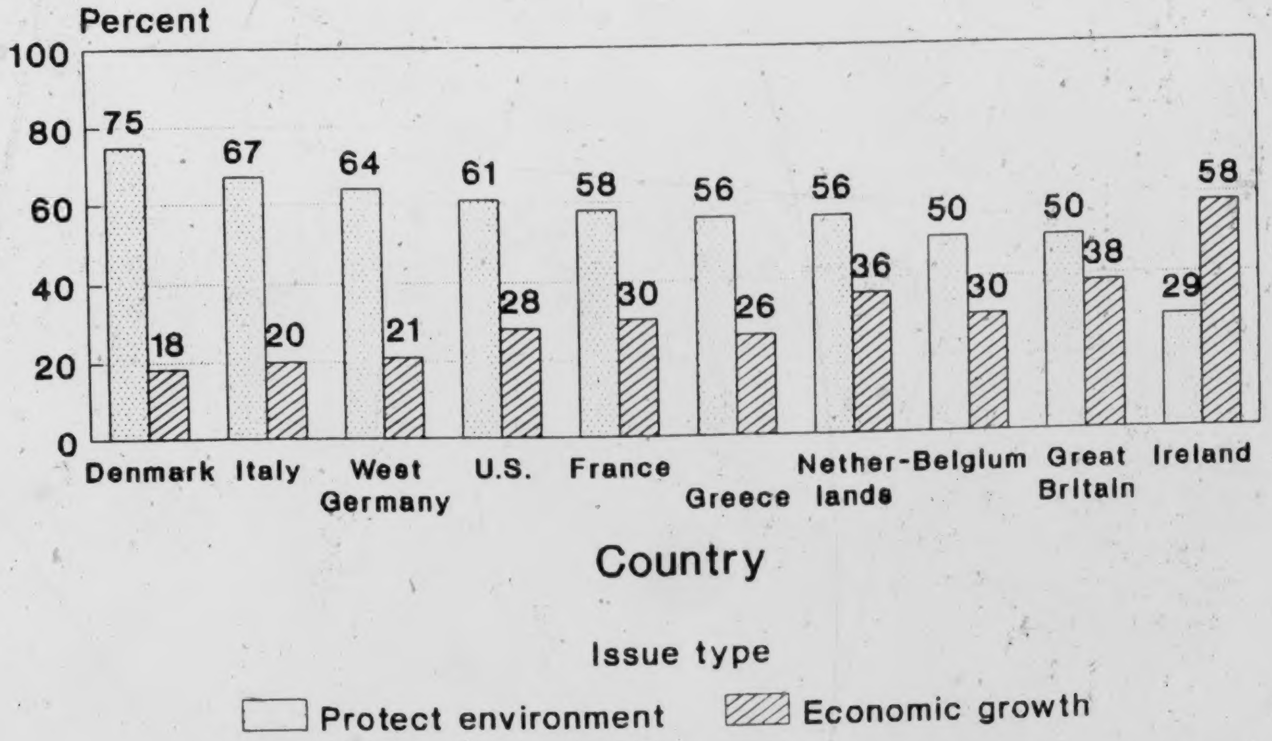
Source: Gallup U.S. 1988a (No copywrwight involved) thought it was a medium priority. As shown in Figure A-4, this suggests that approximately 95 percent of the American population supported an administration which would move to instigate laws to protect the environment (Gallup Poll U.S., 1988).

When faced with a choice between environmental protection and other important issues, respondents appear to have more difficulty making a pro-environmental choice. Although the percentage is lower than in the "concern" distributions, the majority of Europeans (60 percent) chose environmental protection over maintaining low prices (22 percent), and 56 percent would support environmental protection over economic growth (Rabier et al, 1983). Figure A-5 shows that in all countries surveyed except Ireland, environmental protection was rated by citizens as being more important than economic growth. Figure A-6 shows that while 32 percent of Europeans felt that sometimes it is necessary to make a judgement between economic development and protection of the environment, 47 percent felt that protecting the environment was necessary to ensure economic development, and only 10 percent felt that the economy should take priority over the environment (Rabier et al, 1988). Evidently, while having to make a choice between economic growth and environmental protection brings the percentage supporting the environment down, environment still is the preferred response of a majority of respondents.

Figure A-5

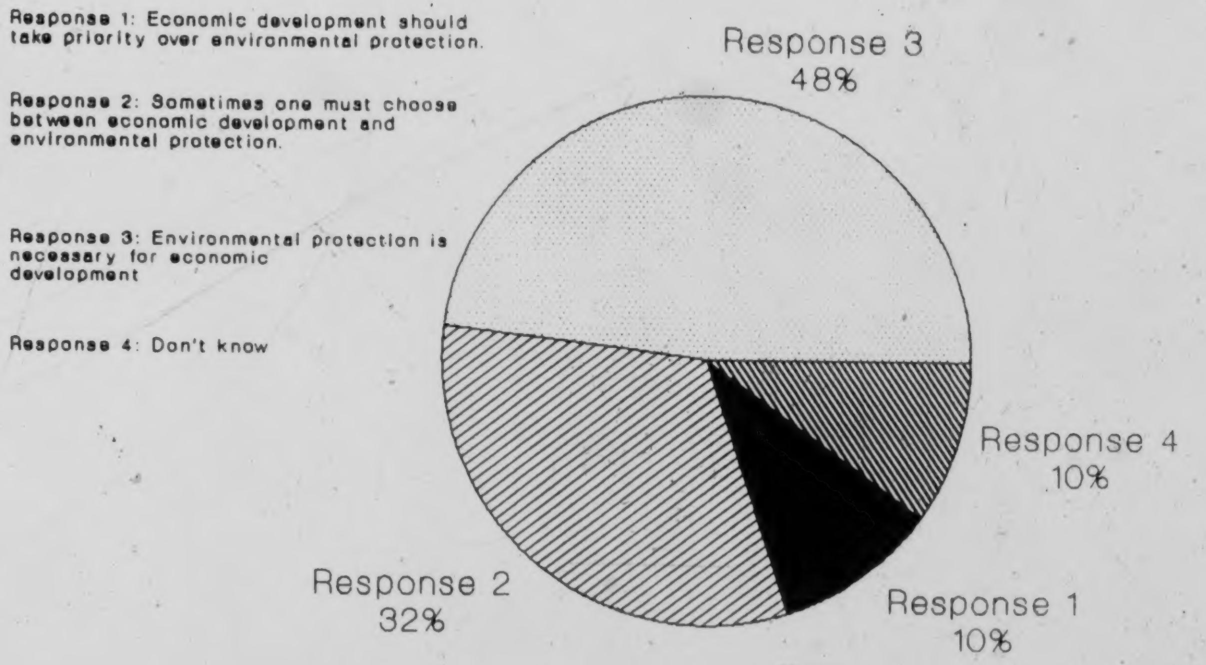
Environment versus Economic Growth

9 European countries & U.S. (1984)



Source: Gallup Poll U.S. 1984 (No copywright involved.)

Figure A-6
Environment versus economy
Europe, 1986



Source: Rabler et al, 1986. (No copywright involved. Data made available in part by the Inter-University Consortium for Political and Social Research. See page 108.)

High reported levels of concern for the environment are not new. In 1973 a majority of Americans (65 percent) felt the government was not spending enough on the environment (Davis, 1974).[1] Dunlap and Van Liere (1978) found a "surprising degree" of acceptance of the tenets of the New Environmental Paradigm in a mid-70's survey of 807 Washington state residents (Table A-2). The lowest degree of support was given by 54 percent of the sample who disagree that mankind was created to rule over the rest of nature. Ninety-six percent felt that humans must live in harmony with nature in order to survive, 83 percent percent felt that earth is like a spaceship with limited room, and 85 percent disagreed with the statement that "humans need not adapt to the natural environment because they can remake it to suite their needs. Other applications of the instrument have found the same high level of commitment to environmental concepts (Dunlap and Van Liere, 1978; Albrecht et al, 1982; Arcury et al, 1987; Geller & Lasley, 1985).

After examining 21 different studies -- all undertaken in the late 1960's and early 1970's -- Dunlap and Van Liere concluded that "[t]he limited utility of demographic variables in explaining variation in environmental concern points to the widespread distribution of such concern in our society. Although somewhat stronger among the young, well-educated, and liberal segments of society, environmental

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This page contained a table from Dunlap and Van Liere, 1978:13) on the items in the New Environmental Paradigm and their frequency distributions.

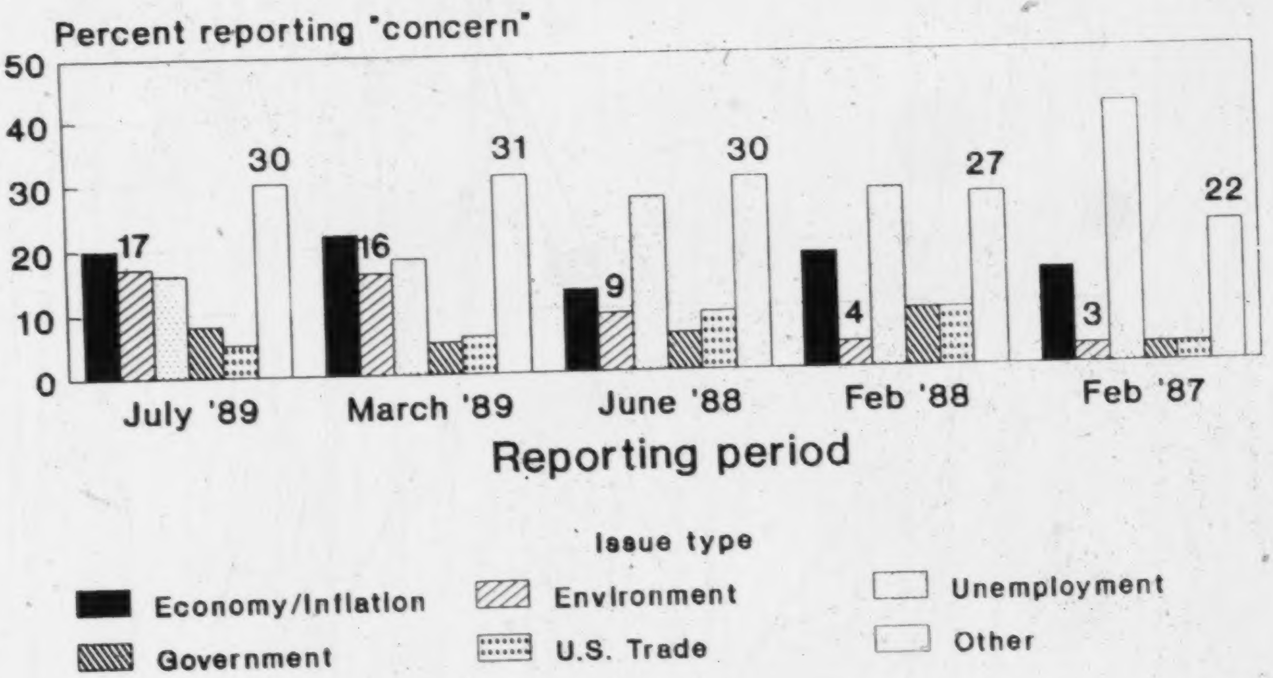
Original source: Dunlap, Riley E. and Van Liere, K.D.
1978 The 'New Environmental Paradigm': A Proposed measuring instrument and preliminary results. Journal of Environmental Education, 9 (Summer):10-19.

concern is by no means restricted to persons with such characteristics" (Van Liere & Dunlap 1980:193).

When people are asked directly about their level of concern over environmental issues, they report concern. However, when "environment" is not provided as a response category and respondents are asked to name important problems, very few volunteer "environment" as a response. Over a two year period between February 1987 and July 1989 in Canada, "environment" was cited as the "most important problem" less often than "unemployment" or "economy and inflation" (Bozinoff & MacIntosh, 1989c) (Figure A-7). In February of 1987, only 3 percent of Canadians felt that the environment was the most important problem, and this figure rose to 17 percent by July of 1989. When environment is offered as a response category, the percent ranking environmental issues as "very" or "somewhat" important shoots back up into the 90 percent level (Figure A-8 and Figure A-9). However, environmental concern shares this high ranking with concern over other social problems such as taxes, illegal drug use and honesty in government.

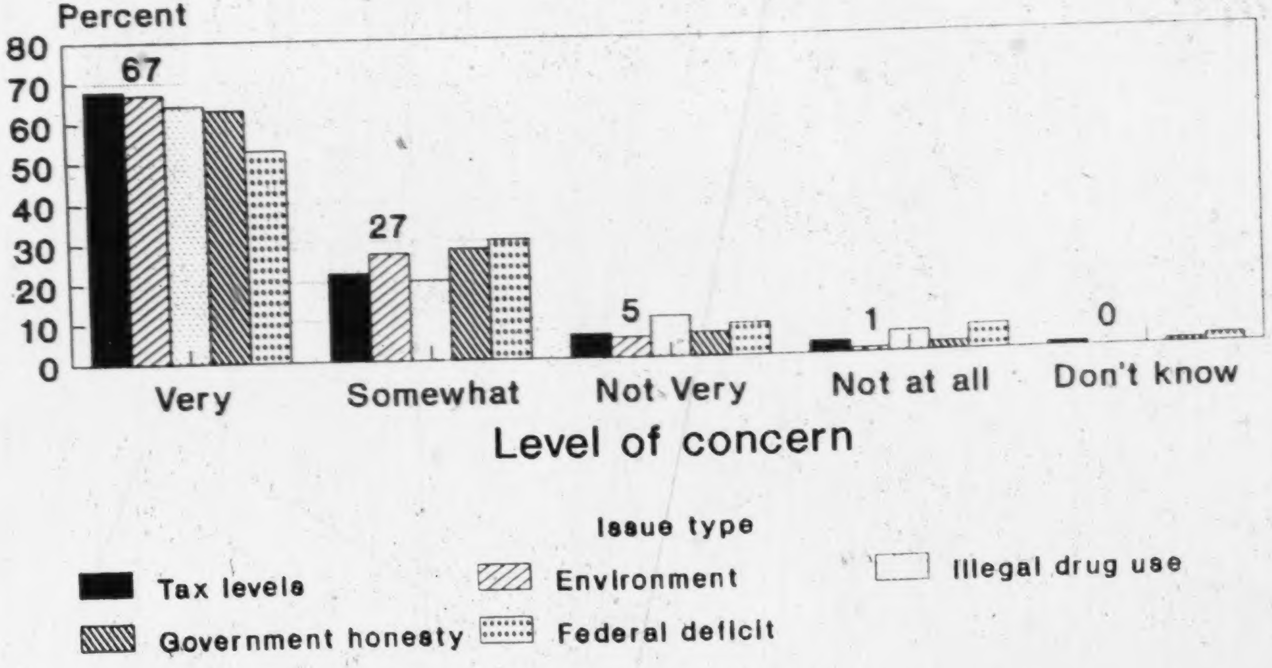
In Alberta, when respondents were asked what the most important problem facing Albertans today was (Population Research Laboratory, 1990), 22 percent cited environment as the most important problem, and 20 percent cited it as the second most important problem. As Figure A-10 shows, environment ranks behind government/political and economic

Figure A-7
Most important problem - Canada
Between Feb. 1987 & July 1989



Source: Gallup Canada, July 31, 1989 (Bozinoff & MacIntosh, 1989b). (No copyright involved.)

Figure A-8
Important Issues - Canada
Tax, Environment, Drugs, Gov't, Deficit

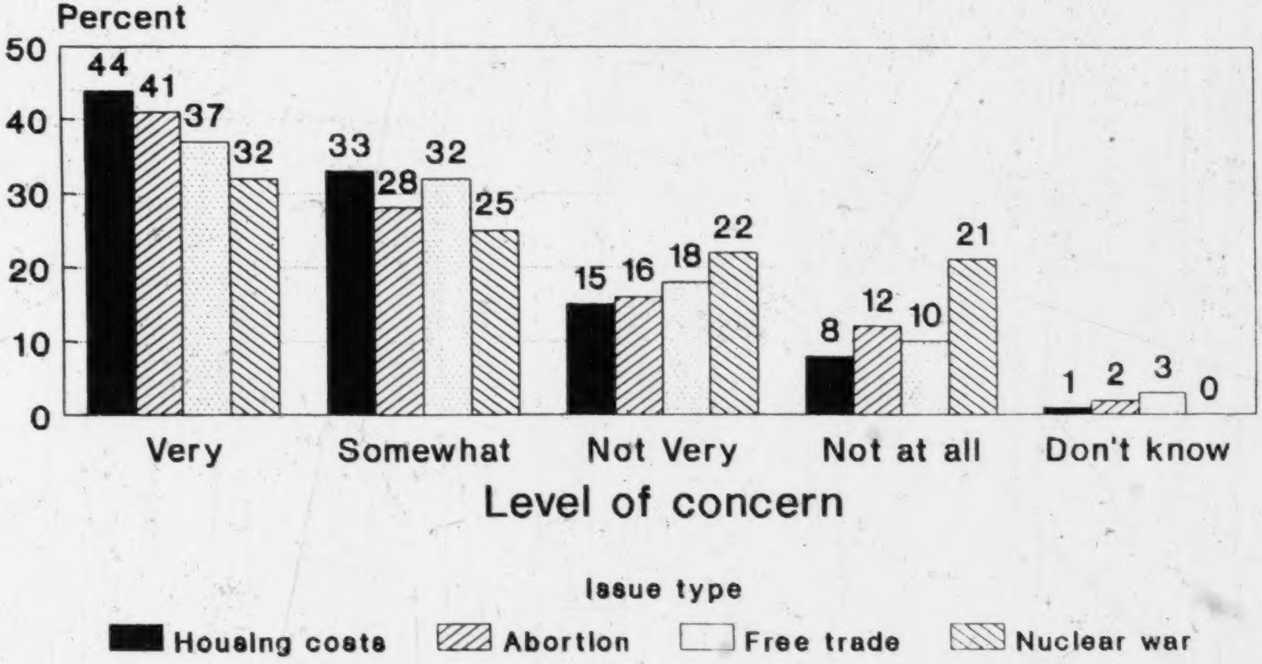


Source: Gallup Canada, July 31, 1989
(Bozinoff & MacIntosh, 1989b). (No copyright involved.)

Figure A-9

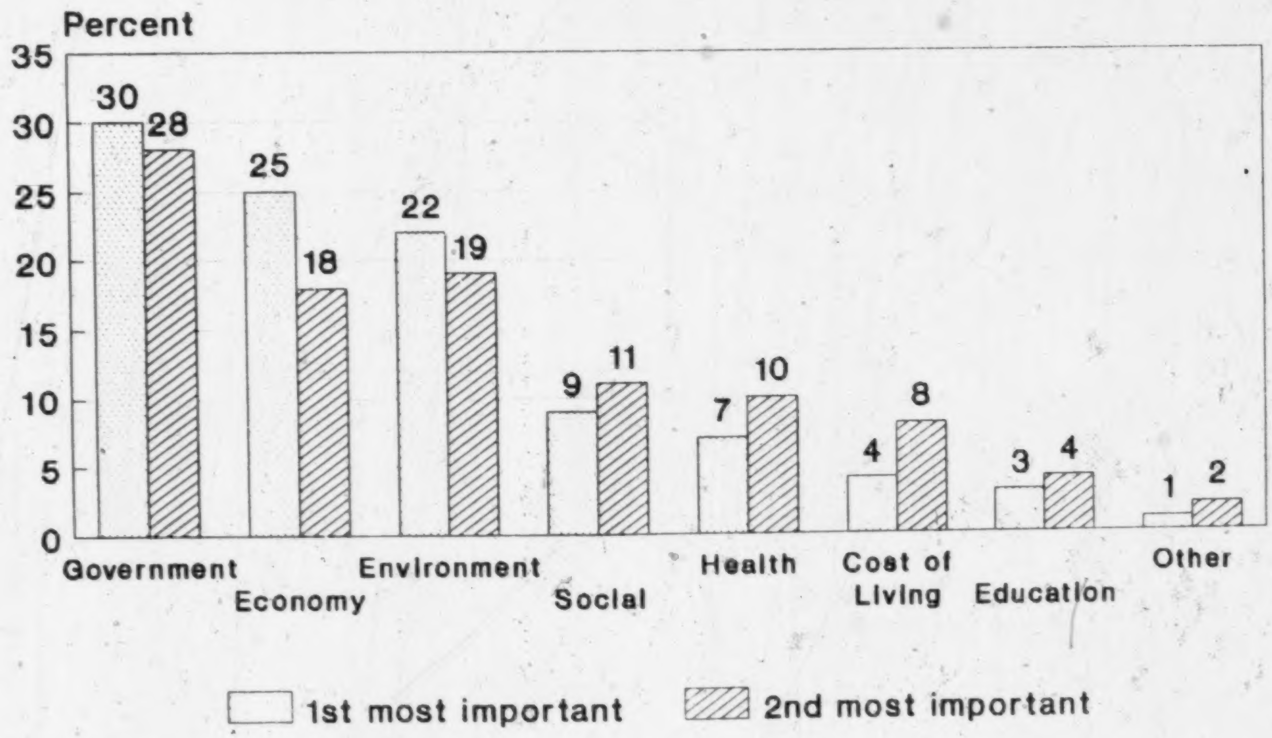
Important Issues - Canada

Housing, Abortion, Free Trade, Nuclear



Source: Gallup Canada, July 31, 1989
(Bozinoff & MacIntosh, 1989b). (No copyright involved.)

Figure A-10
First and second ranked most important problems facing Albertans, 1990



Source: All Alberta Study, 1990
(No copyright involved.)

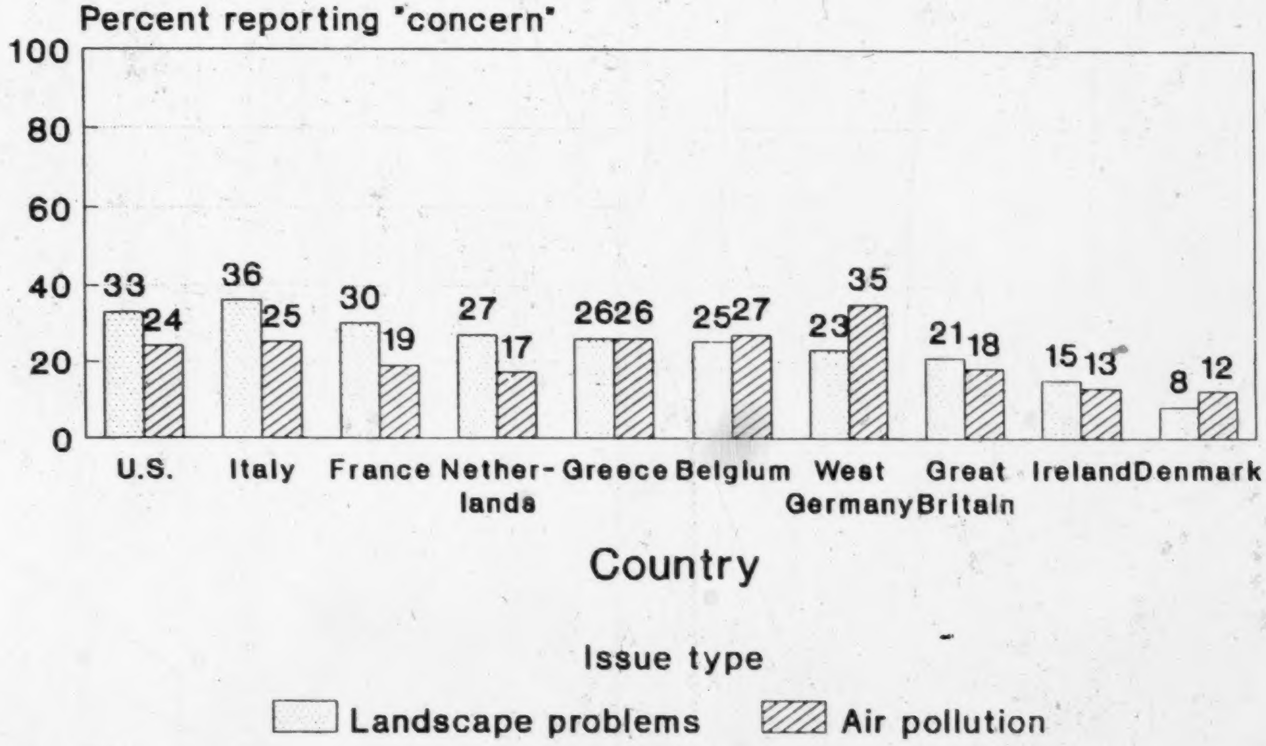
problems in importance, but it is clearly one of the three most important issues. However, we have seen above that almost 90 percent of this sample reported that they were somewhat or very concerned with the environment, but only 22 percent offer it as the "most" important problem facing Albertans. The evidence suggests that when environment is not offered as a response category, the percentage reporting high concern, or identifying it as a problem, drops substantially.

As well, "environmental concern" seems to be somewhat of an abstract phenomena -- concern with a "far away" or removed "environment". Across western Europe and the United States, very few people feel that they have reason to be concerned about either landscape deterioration or air pollution where they live (Figure A-11; Gallup U.S., 1984). While general environmental concern is indisputably high, for most people there may be an absence of the direct experience of environmental problems, leading them to say that they are very concerned about "The Environment", but not concerned with their own "environment". Lack of variation in indicators of environmental concern is problematic in that analytic tools such as correlation, analysis of variance, regression, factor analysis and structural equation modelling are built on the assumption of variation. While it is possible that the skewed distributions are an artifact of the survey research process, the similarity of the patterns over time, country and substantive issue suggests rather that concern has become a cultural constant in western industrialized nations. However, "the environment" shares its high ranking as a social problem with issues such as the economy and unemployment. Further, while general environmental concern is high, this seems to be concern for an "abstract" environment as people do not tend to report environmental problems in their own living environments.

Figure A-11

Environmental concern where people live

9 European countries & U.S., 1984



Source: Gilbert, 1988.

No copyright involved.

ENDNOTES

1.Euro-Barometer 18:Ecological Issues (Rabier et al, 1982) drew a total random sample of N=9,689 from ten European countries: France, Belgium, Netherlands, Germany, Italy, Luxembourg, Denmark, Ireland, United Kingdom and Greece.

2. However, this type of distribution is fairly standard for a government spending on social problems type of question. Responses in this 1973 survey show that the public generally felt that the government was not spending enough on problems, and was spending too much on administration (see Davis, 1974).

3. SA = Strongly Agree; MA = Mildly Agree; MD = Mildly Disagree; SD = Strongly Disagree

4. All numbers are the percent of the sample choosing this response category.

SAMPLING INFORMATION

Euro-Barometer 18 and Euro-Barometer 25: Each national survey was conducted by a professional polling agency. Representative samples of the total population of age fifteen years and older were drawn in each country. The sampling designs were either multi-stage national probability samples or national stratified quota samples (Rabier et al, 1983:iv; 1988:v). For the 1982 survey, representative random samples were drawn from France, Belgium, Netherlands, Germany, Italy, Luxembourg, Denmark, Ireland, United Kingdom and Greece. The total sample size for Euro-Barometer 18 is 9,689, the total weighted N is 9,684.24. In 1986 (Euro-Barometer 25) samples were drawn from the above countries, plus Spain and Portugal. The total sample size is 11,831, the weighted N for all countries combined is 11,831.00.

The sample universe for the British Social Attitudes Survey (1985) included all adults aged 18 or over living in private households in Britain whose addresses were included in electroal registers. The sampling was multi-stage probability using electoral registers as the frame. Total sample size, N=1804. (Witherspoon, 1985:1,9).

DATA

The data and tabulations utilized in this study were made available in part by the Inter-University Consortium for Political and Social Research. The data for Euro-Barometer 18 and Euro-Barometer 25 were originally collected by Jacques-Rene Rabier, Helene Riffault and Ronald Inglehart. The data from the National Data Program for the Social Sciences -- Spring 1973 General Social Survey, were originally collected by James A. Davis of the National Opinion Research Center, the University of Chicago and originally distributed by Roper Public Opinion Research Center, Williams College. The data for the 1985 British Social Attitudes Survey are drawn from Technical Report by Sharon Witherspoon. These data were provided to the ICPSR by the Economic and Social Research Council Survey Archive, University of Essex, Englad. Neither the collectors of the original data nor the Consortium bear any responsibility for the analyses or interpretations presented here.

APPENDIX B

The New Environmental Paradigm

The New Environmental Paradigm (NEP) (Catton & Dunlap, 1978, 1980; Dunlap & Catton, 1978, 1979; Dunlap & Van Liere, 1978) has been, and continues to be a major influence on both the measurement and conceptualization of environmental concern and has become the theoretical core of the "New Human Ecology" (Buttel, 1987). In their first work in the 1970's, Catton and Dunlap suggested that the New Environmental Paradigm and environmental sociology were essentially the same thing (Catton & Dunlap, 1978a:42).

Catton and Dunlap's contention is that "at a broad 'paradigmatic' or metatheoretical level, [there is an] essential similarity of apparently diverse theories based on the classical tradition in terms of their 'shared anthropocentrism'" (Buttel, 1987:468). Through the New Environmental Paradigm , Catton and Dunlap attempted to challenge the foundations of sociology at a meta-theoretical and epistemological level by advancing a theoretical framework which would recognize humans as one species among many, recognize environmental constraints and reciprocal relationships between the biosphere and humanity, and include the physical environment as an inherent component of theoretical concepts. They suggested that the NEP was outside the practice of "normal" science, believing that it provided a whole new meta-theoretical basis for sociology (Catton & Dunlap, 1978, 1980; Dunlap & Catton, 1979a).

In brief, Catton & Dunlap asserted that the shared anthropocentrisms of all prior sociological theory meant that these theories were unable to generate knowledge pertinent to "changed ecological conditions". Sociological theory, because of its anthropocentric foundations and assumptions, provides a set of "glasses" or "blinders", which colour the sociologist's view of the world, and prevent the researcher from generating adequate theoretical models or conducting meaningful, insightful, empirical research. This was an assertion of an epistemological order, suggesting that the "worldview" of Human Exemptionalism Paradigm (HEP) oriented theories quite literally obscured the nature of environmental issues and concerns. The ability of sociology to generate knowledge about contemporary society was compromised by its reliance on anthropocentric, "HEP" generated theory and the solution to this dilemma was the development of theory based on the premises of the New Environmental Paradigm. The New Environmental Paradigm was outside the practice of "normal science", advanced as a meta-theoretical framework[1], which was at once critical of all prior social theory, the methodology by which it generated knowledge (scientific method), and the worldview of the society which gave rise to it. The task for the NEP was enormous: to provide a meta-theoretical foundation for *sociology*, which would allow it to generate knowledge in humanity's "changed" ecological circumstances. The NEP failed to provide a meta-theoretical framework capable of generating research, knowledge or relevant critique -- although it did stimulate several streams of empirical research[2], most of which fall well within the traditional model of sociology rather than in another epistemological arena.

Catton and Dunlap's argument would have been strengthened by recognizing that some of the problems identified as specific to social theory were really endemic to the "worldview" of science, (with its goal of domination and control of nature). One of the assumptions of the philosophy of science is that theories and methods of science are not influenced by, but give us knowledge of, the objective world. Catton and Dunlap suggest that it is the western worldview that has determined our scientific theories and methods -- i.e., our social context, not the objective world. In their eyes, this worldview must change, therefore the theories and methods of social science must also change. (This is a fine goal, but unfortunately, is not what they did.)

Catton and Dunlap correctly suggest that the western worldview has determined the form and content of social scientific theories and methods, but were wrong in assuming this could be rectified by the addition of physical environmental variable to social analysis, and giving lip service to non-anthropocentricism. In their eyes, the western worldview must change, and thus the theories and methods of the social sciences must change as well. However, in exempting science from the influence of the "western worldview", they failed to see that natural science shares the anthropocentrism of the HEP, and insofar as science is based on empiricism and positivism, it is characterized by the anti-environmental goal of dominating and controlling nature. It might have been more correct to say that as far as sociology models itself after the natural sciences, it shares the fundamental assumptions of the natural sciences (rather than saying that social theory shares the worldview of society).

In making theory the straw man, instead of attacking some of the problems with science itself, the NEP constrained its own methodological "proving ground" to the same scientific method used to verify the HEP theories, thus making it impossible for the NEP to be a meta-theory. In reality, the NEP did not offer any methods or perspectives for the generation of new knowledge (in the "changed" ecological conditions confronting western society) which were not completely compatible with prior theoretical and methodological orientations.

The very grandness of the initial design makes the empirical work seemingly generated by the NEP all the more bizarre. At some point, it was decided that the concepts of the NEP could not have occurred to sociologists unless these same concepts were floating about in the larger society.

Logically, empirical research generated by the New Environmental Paradigm would, in attempting to generate empirical knowledge, follow its guidelines as closely as possible. Other than merely stating these beliefs in theoretical discourse, empirical research involving the NEP was based on survey research and did not address the issues of species, intricate cause and effect, or potent biological limits. Instead, it asked the public how they felt about various concepts involved in the *theoretical* development of the NEP, such as "limits to growth", "earth is like a spaceship with limited resources", and "mankind is severely abusing the environment" (Dunlap & Van Liere, 1978). In an absurd twist, the rationale for checking out public opinion on the new epistemological position was this:

> Successful adaptation to the changed situation can be seriously impeded by archaic worldviews and obsolete scientific paradigms. Fortunately, there is evidence that at least some members of the public are beginning to sense that their traditional view of the world and consequent expectations about it, are no longer valid (Catton & Dunlap, 1980:31).

It is in this short paragraph that the entire NEP literature shifts to an empirical verification of the tenets of the NEP. The New Environmental Paradigm as a meta-theory is a problem for the sociology of knowledge and the philosophy of science. However, it has become an empirical problem because the convoluted origins of the New Environmental Paradigm are inseparable from the later empirical research based on it. Interestingly, the original critique of environmental sociology was that existing research was was conservative and traditional, but Catton & Dunlap's own empirical NEP research lies within the same solid, conservative tradition of survey research.

In deciding upon an empirical "test" of the New Environmental Paradigm, Catton and Dunlap confused epistemological issues with those of scientific testing of theory. The concept of the New Environmental Paradigm was supposed to provide an historical (scientific) explanation for why sociology developed the way it did, and suggest meta-theoretical revisions to social theory. An empirical "test" of the theory was unnecessary, and inappropriate in that it took the form of trying to ascertain to what degree the American public agreed with the tenets of the NEP. The primary goal was to show that the fundamental assumptions of social science were incomplete or incorrect because they were anthropocentric and failed to account for the physical environment, and thus called for a "paradigm shift" to new epistemological assumptions within that science. The empirical test of the NEP was totally inappropriate, and unfortunately has since been at the center of empirical investigation of environmental concern within sociology (Buttel, 1987; Arcury & Johnson, 1986; Abbott & Harris, 1985-86; Geller & Lasley, 1985; Hand & Van Liere, 1984; Albrecht et al, 1982; Van Liere & Dunlap, 1981; Catton & Dunlap, 1978, 1980; Dunlap & Catton, 1979a; Dunlap & Van Liere, 1978, 1983, 1984; Buttel, 1978.

One of the problems with the original application of the NEP was a lack of variance in the individual items (Dunlap & Van Liere, 1978; see Appendix A, Table 2). The attenuation of variance may have lowered, or nullified correlations and regression slopes, leading to the conclusion that socio-demographic variables do not predict environmental concern very well (Van Liere & Dunlap, 1980).
However, the researchers concluded that the skewed responses to the indicated a high level of environmental concern and support for the NEP among the public and environmental activists rather than identifying them as methodological or conceptual problems. However, as shown in Appendix A, these extremely skewed responses mean that the NEP -- and environmental concern in general -- functions more like a cultural constant than a variable.

Other applications of the NEP have obtained similar results (Albrecht et al, 1982; Arcury et al, 1986; Geller & Lasley, 1985) leading other researchers to agree with Dunlap and Van Liere's conclusion that pro-environmental concepts such as 'limits to growth' and 'spaceship earth' enjoy wide public support. This conclusion is problematic for two reasons. The first is strictly methodological: to use environmental concern as a dependent variable the indicator must have variance, and empirical data shows that it does not.

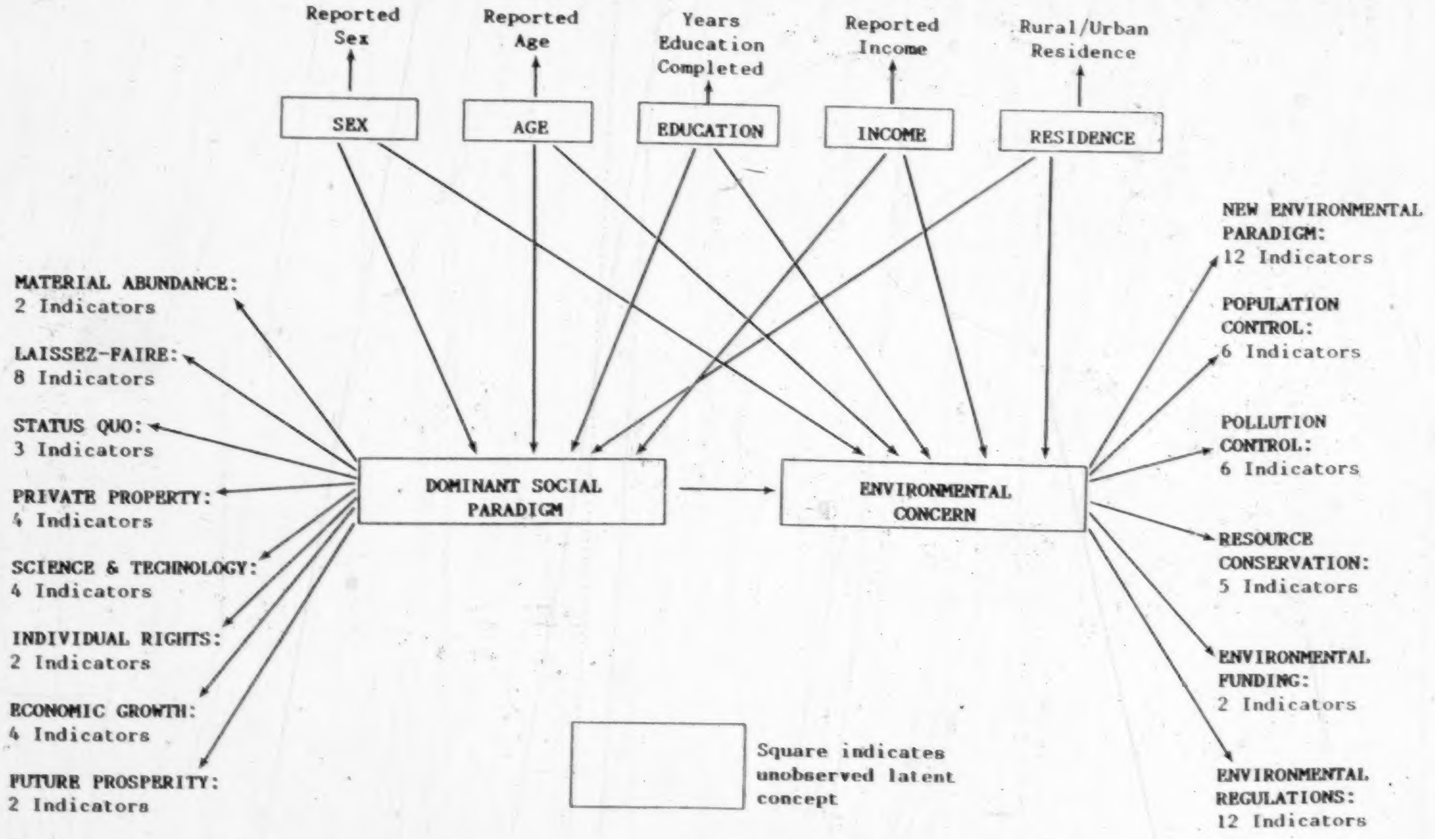
The second problem is conceptual and theoretical. The NEP is a model of a societal level transition to a different, "environment friendly" set of values. It is contrasted directly with the profoundly anti-ecological "Dominant Social Paradigm" (DSP) (Dunlap & Van Liere, 1984).

> "[The Dominant Social Paradigm is] a useful shorthand term for the constellation of 'common values, beliefs, and shared wisdom about the physical and social environments' which constitute a society's basic 'worldview'. ...[T]he paradigm ... provides general guidance for both individual and societal behaviour" (Dunlap & Van Liere, 1984:1013)."

The causal model implied by the NEP and DSP concepts is shown in Figure B-1.[3] This model is structural, showing the latent unobserved concepts, their latent factors, and the empirical indicators of the latent factors. An empirical text would require estimation with a structural equation program such as LISREL or EQS. In this model, environmental concern is the major dependent variable, with its variance coming from the DSP and from the standard socio-demographic variables arrayed at the top of the diagram. The New Environmental Paradigm is a factor of Environmental Concern and has 12 of its own indicators.

In this model, the Dominant Social Paradigm causes Environmental Concern. While the NEP is the major concept developed in the literature, in the model it plays a minor role as one of six indicators of the latent concept "Environmental Concern". The NEP, as an indicator, is not in

Figure B-1
Causal model of the New Environmental Paradigm & the Dominant Social Paradigm


Reported Sex
Reported Age
Years Education Completed
Reported Income
Rural/Urban Residence
SEX
AGE
EDUCATION
INCOME
RESIDENCE
MATERIAL ABUNDANCE: 2 Indicators
LAISSEZ-FAIRE: 8 Indicators
STATUS QUO: 3 Indicators
PRIVATE PROPERTY: 4 Indicators
SCIENCE & TECHNOLOGY: 4 Indicators
INDIVIDUAL RIGHTS: 2 Indicators
ECONOMIC GROWTH: 4 Indicators
FUTURE PROSPERITY: 2 Indicators
DOMINANT SOCIAL PARADIGM
ENVIRONMENTAL CONCERN
NEW ENVIRONMENTAL PARADIGM: 12 Indicators
POPULATION CONTROL: 6 Indicators
POLLUTION CONTROL: 6 Indicators
RESOURCE CONSERVATION: 5 Indicators
ENVIRONMENTAL FUNDING: 2 Indicators
ENVIRONMENTAL REGULATIONS: 12 Indicators
Square indicates unobserved latent concept

a position to act causally, but reflects changes in the latent concepts of DSP, socio-demographic variables, and Environmental Concern. In this model the New Environmental Paradigm cannot be a challenge to the Dominant Social Paradigm, although the literature concludes that not only is it a challenge to the DSP -- but has almost superceded it in public commitment (Dunlap & Van Liere, 1978).

The intent was to provide a theoretical framework for a paradigmatic transition in society to an ecological worldview (and along the way developed a concept and measure of environmental concern). At a macro-level, the DSP-NEP model assumes that variation in a "Dominant Social Paradigm" is evident at the individual level[4]. To get meaningful variation in "Dominant Social Paradigms" would require a comparison of societies -- or at the very least communities, rather than individuals within a community. Presumably a DSP is a component of social structure, meaning all members of a community or society are under the influence of the same DSP. To see the effect of pervasive, "dominant", structural characteristics requires variation in those same characteristics. The NEP assumed that societal values are a function of individual values, and that a direct correspondence exists between attitude and behaviour, with behaviour being the real-world manifestation of attitude. As developed in the body of this paper, individual behaviour may be more influenced by social structure than by individual attitudes, and a meaningful explanation identifies the social structural and individual conditions under which attitudes can translate into behavior.

The goal of the empirical New Environmental Paradigm was good - to show a transition at the societal level towards more ecologically sound values and behaviours. However, the methods used were not appropriate to test the theory. Further, unresolved meta-theoretical and epistemological problems in the genesis of the NEP confound the conclusions reached from empirical research.

ENDNOTES

1. Buttel (1978) argues that the NEP is a perspective that is possible within each "paradigm" in sociology, meaning that it is not a meta-theory. Dunlap and Catton (1979a) argue that because the physical environment has been ignored by sociologists its addition as a variable constitutes an entirely new paradigm for sociology.

2. Buttel suggests that "because [Catton & Dunlap's] theoretical work has been written at a highly abstract -- essentially a metatheoretical -- level, it has not been readily usable in empirical research" (Buttel, 1987:469). Buttel (1987) identifies the three major research areas stimulated by Catton & Dunlap's approach as first, Catton's book "*Overshoot*", which developed the ecological notion of carrying capacity for sociology and is quite similar to the Club of Rome's "*Limits to Growth*". The second stimulus was in agricultural research including migration, part-time farming patterns and the role of climate in shaping energy consumption. The third focus was survey research exploring attitudinal commitment to the Dominant Social Paradigm and the New Environmental Paradigm (Dunlap & Van Liere, 1978, 1984).

3. This model has been developed by the author utilizing the published results of empirical research on the Dominant Social Paradigm and the New Environmental Paradigm. It is based on Dunlap & Van Liere, 1978; 1983; 1984; Catton & Dunlap 1978; 1980; Van Liere & Dunlap, 1981 -- but does not appear anywhere in their work. This model is my idea of what is implied by the empirical research to date.

4. The model also assumes that variation in individual responses is due to variation in the latent concept of the Dominant Social Paradigm (Hayduk, 1988).

APPENDIX C

The following is a list of the original variable numbers and question wordings for the items used in this analysis. Question number on the telephone survey are included in brackets after the text of the question

VAR001: Type and area of interviewing
telephone interviewing - remainder of Alberta = 1
telephone interviewing - Calgary = 2
face to face interviewing - Edmonton = 3

VAR023: Sex of respondent
male 1
female 2
nr 0

VAR024: Age of respondent
coded actual age in years

VAR059: Question 3c. What, in your opinion, are the two most important issues facing Alberta today? RANK TWO (Q3c TEL)

VAR060: Same as Var059 but second most important issue.

VAR220: Question 42. How concerned are you about the state of the earth's environment? (Q31 tel)
1 = Not at all concerned
7 = Very concerned
8 = DK
0 = NR

VAR221: Question 43. In your opinion, what is the likelihood of the world's major environment problems being successfully dealt with within the next ten years? (Q32 tel)
1 = Not at all likely
7 = Very likely

Question 44. What items are currently recycled in this household? (Q33 tel)
1 = Yes 2 = No 8 = DK 0 = NR

VAR222: beverage cans and bottles
VAR223: newspapers
VAR224: household plastics
VAR225: milk cartons
VAR226: food cans
VAR227: other paper products
VAR228: compost material
VAR229: motor oil
VAR230: glass jars/glass

VAR231: clothing/toys/furniture

VAR232: other:
batteries, chemicals, metal and wood products, recycling water

VAR233: Question 45. How do you usually dispose of things like paint, turpentine and other cleaning solvents?
1 = throw them in the garbage
2 = pour them down the drain
3 = take them to a firehall or disposal facility
4 = save them for the "Toxic Roundup" week
5 = store them (e.g. basement, garage)
6 = pour on ground or weeds/bury in hole
85 = don't use them
86 = use them up
87 = other (specify)
88 = don't know

Question 46. Please tell me you much you agree or disagree with these statements:
Coding for all:
1 = Strongly disagree
7 = Strongly agree
8 = DK 9 = NA TEL 0 = NR

VAR234: 46a. Our food is becoming unsafe because of food additives.

VAR235: 46b. I trust the Alberta government to manage environmental problems adequately. (Q34 tel)

VAR236: 46c. The benefits from new pulp mills (royalties, taxes, jobs) are worth the damage they m ay cause to the environment.

VAR237: 46d. Protecting the environment is more important than creating new jobs in Alberta.

VAR238: Question 47. Now, think about a product in a grocery store or a hardware store that usually costs you ten dollars. If an environmentally safe alternative to that product was available, how much more money would you pay for it?
01 = $0 extra
02 = 50 cents extra
03 = $1 extra
04 = $1.50 extra
05 = $2 extra
06 = $3 extra
07 = $4 extra

08 = $5 extra
09 = more than $5 extra
88 = don't know

Question 48. Please tell me how often you take steps to do the following?
Coding for all: 1 = Never, 7 = Always, 8 = DK

VAR239: 48a. Take steps to be careful about protecting yourself from the sun.

VAR240: 48b. Try to purchase organically grown foods.

VAR241: 48c. Conserve energy by turning down the thermostat at night.

APPENDIX D

Table D-1
Pearson Correlation Coefficients

	RECYCLE	CONCERN	AGE	SEX	EDUC2	INCOME	PRESTIGE	EDMONTON	CALGARY	ALBERTA	PC
RECYCLE	1.0000 (1005) P= .	.0768 (1004) P= .007	.1178 (1001) P= .000	-.0135 (1005) P= .334	.0728 (1003) P= .011	.0252 (889) P= .226	.0669 (982) P= .018	.4950 (1005) P= .000	-.2171 (1005) P= .000	-.3019 (1005) P= .000	-.0322 (1005) P= .154
CONCERN	.0768 (1004) P= .007	1.0000 (1240) P= .	-.0714 (1235) P= .006	-.0110 (1240) P= .350	.1000 (1237) P= .000	.0323 (1094) P= .143	.0776 (1210) P= .003	-.0004 (1240) P= .494	.0099 (1240) P= .363	-.0095 (1240) P= .369	-.0266 (1240) P= .175
AGE	.1178 (1001) P= .000	-.0714 (1235) P= .006	1.0000 (1240) P= .	-.0582 (1240) P= .020	-.2436 (1238) P= .000	-.0248 (1096) P= .206	.0023 (1209) P= .468	-.0525 (1240) P= .032	-.0545 (1240) P= .027	.1089 (1240) P= .000	.0464 (1240) P= .051
SEX	-.0135 (1005) P= .334	-.0110 (1240) P= .350	-.0582 (1240) P= .020	1.0000 (1245) P= .	.0877 (1242) P= .001	.4455 (1098) P= .000	.1219 (1214) P= .000	-.0109 (1245) P= .350	.0013 (1245) P= .482	.0100 (1245) P= .363	.0178 (1245) P= .265
EDUC2	.0728 (1003) P= .011	.1000 (1237) P= .000	-.2436 (1238) P= .000	.0877 (1242) P= .001	1.0000 (1242) P= .	.3048 (1097) P= .000	.5666 (1211) P= .000	.0139 (1242) P= .313	.1471 (1242) P= .000	-.1621 (1242) P= .000	.0325 (1242) P= .126
INCOME	.0252 (889) P= .226	.0323 (1094) P= .143	-.0248 (1096) P= .206	.4455 (1098) P= .000	.3048 (1097) P= .000	1.0000 (1098) P= .	.4694 (1076) P= .000	-.0653 (1098) P= .015	.0464 (1098) P= .062	.0231 (1098) P= .223	.0870 (1098) P= .002
PRESTIGE	.0669 (982) P= .018	.0776 (1210) P= .003	.0023 (1209) P= .468	.1219 (1214) P= .000	.5666 (1211) P= .000	.4694 (1076) P= .000	1.0000 (1214) P= .	-.0122 (1214) P= .335	.1182 (1214) P= .000	-.1068 (1214) P= .000	.0240 (1214) P= .202
EDMONTON	.4950 (1005) P= .000	-.0004 (1240) P= .494	-.0525 (1240) P= .032	-.0109 (1245) P= .350	.0139 (1242) P= .313	-.0653 (1098) P= .015	-.0122 (1214) P= .335	1.0000 (1245) P= .	-.5168 (1245) P= .000	-.5120 (1245) P= .000	-.0637 (1245) P= .012
CALGARY	-.2171 (1005) P= .000	.0099 (1240) P= .363	-.0545 (1240) P= .027	.0013 (1245) P= .482	.1471 (1242) P= .000	.0464 (1098) P= .062	.1182 (1214) P= .000	-.5168 (1245) P= .000	1.0000 (1245) P= .	-.4708 (1245) P= .000	.0350 (1245) P= .108
ALBERTA	-.3019 (1005) P= .000	-.0095 (1240) P= .369	.1089 (1240) P= .000	.0100 (1245) P= .363	-.1621 (1242) P= .000	.0231 (1098) P= .223	-.1068 (1214) P= .000	-.5120 (1245) P= .000	-.4708 (1245) P= .000	1.0000 (1245) P= .	.0305 (1245) P= .141
PC	-.0322 (1005) P= .154	-.0266 (1240) P= .175	.0464 (1240) P= .051	.0178 (1245) P= .265	.0325 (1242) P= .126	.0870 (1098) P= .002	.0240 (1214) P= .202	-.0637 (1245) P= .012	.0350 (1245) P= .108	.0305 (1245) P= .141	1.0000 (1245) P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)   " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table D-1 (continued)
Pearson Correlation Coefficients

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              RECYCLE    CONCERN    AGE        SEX        EDUC2      INCOME     PRESTIGE   EDMONTON   CALGARY    ALBERTA    PC

LIBERAL        .0476      .0181     -.0446      .0643      .0498      .0393      .0636      .1062     -.0183     -.0911     -.2065
              ( 1005)    ( 1240)    ( 1240)    ( 1245)    ( 1242)    ( 1098)    ( 1214)    ( 1245)    ( 1245)    ( 1245)    ( 1245)
              P= .066    P= .262    P= .058    P= .012    P= .040    P= .096    P= .013    P= .000    P= .260    P= .001    P= .000

NDP            .1061      .0943     -.0627     -.0180      .0636     -.0404      .0274      .2192     -.1431     -.0823     -.2046
              ( 1005)    ( 1240)    ( 1240)    ( 1245)    ( 1242)    ( 1098)    ( 1214)    ( 1245)    ( 1245)    ( 1245)    ( 1245)
              F= .000    P= .000    P= .014    P= .262    P= .012    P= .091    P= .170    P= .000    P= .000    P= .002    P= .000

REFORM         .0613     -.0115      .0266      .0777      .0372      .0896      .0656     -.0514      .0769     -.0242     -.2065
              ( 1005)    ( 1240)    ( 1240)    ( 1245)    ( 1242)    ( 1098)    ( 1214)    ( 1245)    ( 1245)    ( 1245)    ( 1245)
              P= .026    P= .342    P= .175    P= .003    P= .095    P= .001    P= .011    P= .035    P= .003    P= .197    P= .000

TRUST         -.0551     -.0579      .1091     -.0818     -.0684     -.0908     -.0707     -.0418      .0099      .0333      .1866
              (  992)    ( 1219)    ( 1217)    ( 1222)    ( 1219)    ( 1082)    ( 1193)    ( 1222)    ( 1222)    ( 1222)    ( 1222)
              P= .041    P= .022    P= .000    P= .002    P= .008    P= .001    P= .007    P= .072    P= .365    P= .122    P= .000

FOOD          -.0667      .2078      .0880     -.1592     -.1387     -.1627     -.1532                                      -.0688
              (  372)    (  443)    (  443)    (  443)    (  442)    (  428)    (  435)    (  443)    (  443)    (  443)    (  443)
              P= .100    P= .000    P= .032    P= .000    P= .002    P= .000    P= .001    P= .       P= .       P=         P= .074

PULP          -.0852     -.2837      .0266      .0121     -.0611     -.0575     -.0109                                       .1146
              (  364)    (  428)    (  428)    (  428)    (  427)    (  414)    (  422)    (  428)    (  428)    (  428)    (  428)
              P= .052    P= .000    P= .291    P= .402    P= .104    P= .121    P= .412    P= .       P= .       P=         P= .009

ENVJOBS        .0095      .1689      .0203      .0067      .0550      .0753      .0828                                      -.0702
              (  367)    (  438)    (  438)    (  438)    (  437)    (  425)    (  430)    (  438)    (  438)    (  438)    (  438)
              P= .428    P= .000    P= .336    P= .445    P= .125    P= .061    P= .043    P= .       P=         P=         P= .071

PAY           -.0917      .1370     -.1793     -.0629      .0880      .0200      .0588                                       .0108
              (  358)    (  419)    (  419)    (  419)    (  418)    (  406)    (  411)    (  419)    (  419)    (  419)    (  419)
              P= .042    P= .002    P= .000    P= .099    P= .036    P= .344    P= .117    P= .       P= .       P= .       P= .412

SUN            .0215      .1935     -.0110     -.1275      .1369      .0228      .1422                                      -.0557
              (  376)    (  448)    (  448)    (  448)    (  447)    (  433)    (  439)    (  448)    (  448)    (  448)    (  448)
              P= .339    P= .000    P= .408    P= .003    P= .002    P= .318    P= .001    P= .       P=         P=         P= .120

ORGANIC        .0261      .2350      .0537     -.0866      .0299     -.0742     -.0396                                      -.0033
              (  370)    (  439)    (  439)    (  439)    (  438)    (  424)    (  430)    (  439)    (  439)    (  439)    (  439)
              P= .309    P= .000    P= .131    P= .035    P= .266    P= .064    P= .206    P= .       P=         P=         P= .472

CONSERVE       .1598      .1382      .0940     -.0236      .0721      .1222      .1662                                       .0287
              (  371)    (  441)    (  441)    (  441)    (  440)    (  426)    (  432)    (  441)    (  441)    (  441)    (  441)
              P= .001    P= .002    P= .024    P= .311    P= .066    P= .006    P= .000    P=         P=         P=         P= .274

(COEFFICIENT / (CASES) / 1-TAILED SIG)          " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
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Table D-1 (continued)
Pearson Correlation Coefficients

	LIBERAL	NDP	REFORM	TRUST	FOOD	PULP	ENVJOBS	PAY	SUN	ORGANIC	CONSERVE
RECYCLE	.0476 (1005) P= .066	.1061 (1005) P= .000	.0613 (1005) P= .026	-.0551 (992) P= .041	-.0667 (372) P= .100	-.0852 (364) P= .052	.0095 (367) P= .428	-.0917 (358) P= .042	.0215 (376) P= .339	.0261 (370) P= .309	.1598 (371) P= .001
CONCERN	.0181 (1240) P= .262	.0943 (1240) P= .000	-.0115 (1240) P= .342	-.0579 (1219) P= .022	.2078 (443) P= .000	-.2837 (428) P= .000	.1689 (438) P= .000	.1370 (419) P= .002	.1935 (448) P= .000	.2350 (439) P= .000	.1382 (441) P= .002
AGE	-.0446 (1240) P= .058	-.0627 (1240) P= .014	.0266 (1240) P= .175	.1091 (1217) P= .000	.0880 (443) P= .032	.0266 (428) P= .291	.0203 (438) P= .336	-.1793 (419) P= .000	-.0110 (448) P= .408	.0537 (439) P= .131	.0940 (441) P= .024
SEX	.0643 (1245) P= .012	-.0180 (1245) P= .262	.0777 (1245) P= .003	-.0818 (1222) P= .002	-.1592 (443) P= .000	.0121 (428) P= .402	.0067 (438) P= .445	-.0629 (419) P= .099	-.1275 (448) P= .003	-.0866 (439) P= .035	-.0236 (441) P= .311
EDUC2	.0498 (1242) P= .040	.0636 (1242) P= .012	.0372 (1242) P= .095	-.0684 (1219) P= .008	-.1387 (442) P= .002	-.0611 (427) P= .104	.0550 (437) P= .125	.0880 (416) P= .036	.1369 (447) P= .002	.0299 (438) P= .266	.0721 (440) P= .066
INCOME	.0393 (1098) P= .096	-.0404 (1098) P= .091	.0896 (1098) P= .001	-.0908 (1082) P= .001	-.1627 (428) P= .000	-.0575 (414) P= .121	.0753 (425) P= .061	.0200 (406) P= .344	.0228 (433) P= .318	-.0742 (424) P= .064	.1222 (426) P= .006
PRESTIGE	.0636 (1214) P= .013	.0274 (1214) P= .170	.0656 (1214) P= .011	-.0707 (1193) P= .007	-.1532 (435) P= .001	-.0109 (422) P= .412	.0828 (430) P= .043	.0588 (411) P= .117	.1422 (439) P= .001	-.0396 (430) P= .206	.1662 (432) P= .000
EDMONTON	.1062 (1245) P= .000	.2192 (1245) P= .000	-.0514 (1245) P= .035	-.0418 (1222) P= .072	(443) P= .	(428) P= .	(438) P= .	(419) P= .	(448) P= .	(439) P= .	(441) P= .
CALGARY	-.0183 (1245) P= .260	-.1431 (1245) P= .000	.0769 (1245) P= .003	.0099 (1222) P= .365	(443) P= .	(428) P= .	(438) P= .	(419) P= .	(448) P= .	(439) P= .	(441) P= .
ALBERTA	-.0911 (1245) P= .001	-.0823 (1245) P= .002	-.0242 (1245) P= .197	.0333 (1222) P= .122	(443) P= .	(428) P= .	(438) P= .	(419) P= .	(448) P= .	(439) P= .	(441) P= .
PC	-.2065 (1245) P= .000	-.2046 (1245) P= .000	-.2065 (1245) P= .000	.1866 (1222) P= .000	-.0688 (443) P= .074	.1146 (428) P= .009	-.0702 (438) P= .071	.0108 (419) P= .412	-.0557 (448) P= .120	-.0033 (439) P= .472	.0287 (441) P= .274

(COEFFICIENT / (CASES) / 1-TAILED SIG)   " . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED

Table D-1 (continued)
Pearson Correlation Coefficients

	LIBERAL	NDP	REFORM	TRUST	FOOD	PULP	ENVJOBS	PAY	SUN	ORGANIC	CONSERVE
LIBERAL	1.0000 (1245) P= .	-.1806 (1245) P= .000	-.1823 (1245) P= .000	-.0537 (1222) P= .030	.0893 (443) P= .030	.0118 (428) P= .404	-.0604 (438) P= .104	.0069 (419) P= .444	.0474 (448) P= .159	.0418 (439) P= .191	-.0307 (441) P= .260
NDP	-.1806 (1245) P= .000	1.0000 (1245) P= .	-.1806 (1245) P= .000	-.1233 (1222) P= .000	.0432 (443) P= .182	-.1380 (428) P= .002	.1299 (438) P= .003	.0923 (419) P= .030	.0217 (448) P= .324	-.0402 (439) P= .201	-.0333 (441) P= .243
REFORM	-.1823 (1245) P= .000	-.1806 (1245) P= .000	1.0000 (1245) P= .	-.1265 (1222) P= .000	-.1010 (443) P= .017	-.0318 (428) P= .256	.0421 (438) P= .190	-.0323 (419) P= .255	.0647 (448) P= .086	.0290 (439) P= .272	.1356 (441) P= .002
TRUST	-.0537 (1222) P= .030	-.1233 (1222) P= .000	-.1265 (1222) P= .000	1.0000 (1222) P= .	-.0098 (438) P= .419	.3611 (425) P= .000	-.1953 (434) P= .000	-.0922 (416) P= .030	.0315 (443) P= .254	.0808 (435) P= .046	.0363 (436) P= .225
FOOD	.0893 (443) P= .030	.0432 (443) P= .182	-.1010 (443) P= .017	-.0098 (438) P= .419	1.0000 (443) P= .	-.0888 (424) P= .034	.1521 (435) P= .001	-.0206 (416) P= .338	.0316 (443) P= .253	.3158 (434) P= .000	-.0005 (436) P= .496
PULP	.0118 (428) P= .404	-.1380 (428) P= .002	-.0318 (428) P= .256	.3611 (425) P= .000	-.0888 (424) P= .034	1.0000 (428) P= .	-.2599 (421) P= .000	-.0455 (403) P= .181	-.1081 (428) P= .013	-.0884 (422) P= .035	.0035 (421) P= .471
ENVJOBS	-.0604 (438) P= .104	.1299 (438) P= .003	.0421 (438) P= .190	-.1953 (434) P= .000	.1521 (435) P= .001	-.2599 (421) P= .000	1.0000 (438) P= .	.0876 (413) P= .038	.1089 (438) P= .011	.0686 (430) P= .078	.0444 (431) P= .179
PAY	.0069 (419) P= .444	.0923 (419) P= .030	-.0323 (419) P= .255	-.0922 (416) P= .030	-.0206 (416) P= .338	-.0455 (403) P= .181	.0876 (413) P= .038	1.0000 (419) P= .	.0053 (419) P= .457	.0249 (413) P= .307	.0470 (413) P= .170
SUN	.0474 (448) P= .159	.0217 (448) P= .324	.0647 (448) P= .086	.0315 (443) P= .254	.0316 (443) P= .253	-.1081 (428) P= .013	.1089 (438) P= .011	.0053 (419) P= .457	1.0000 (448) P= .	.2614 (439) P= .000	.1366 (441) P= .002
ORGANIC	.0418 (439) P= .191	-.0402 (439) P= .201	.0290 (439) P= .272	.0808 (435) P= .046	.3158 (434) P= .000	-.0884 (422) P= .035	.0686 (430) P= .078	.0249 (413) P= .307	.2614 (439) P= .000	1.0000 (439) P= .	.1530 (433) P= .001
CONSERVE	-.0307 (441) P= .260	-.0333 (441) P= .243	.1356 (441) P= .002	.0363 (436) P= .225	-.0005 (436) P= .496	.0035 (421) P= .471	.0444 (431) P= .179	.0470 (413) P= .170	.1366 (441) P= .002	.1530 (433) P= .001	1.0000 (441) P= .

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